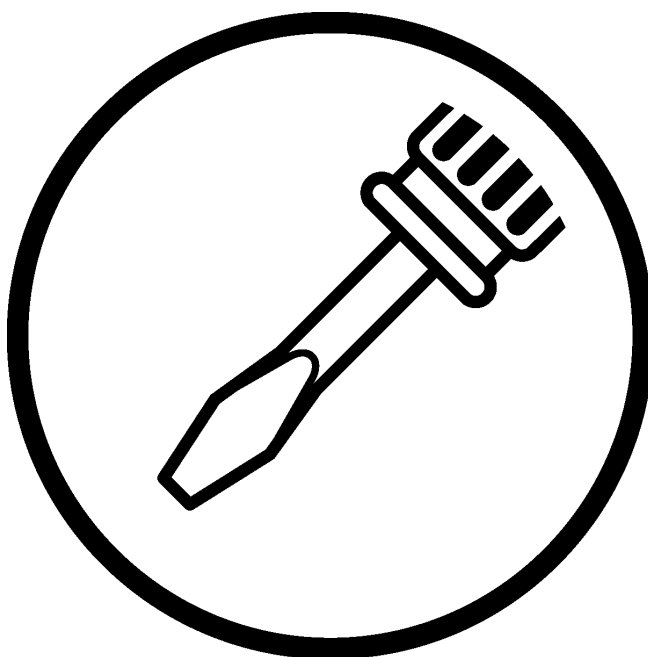


BAS-7610, 761

SERVICE MANUAL

Please read this manual before making any adjustments.

AUTOMATIC POCKET SETTER <JEANS>



brother®

This service manual is intended for BAS-7610, BAS-761; be sure to read the BAS-7610, BAS-761 instruction manual before this manual.

Carefully read the “SAFETY INSTRUCTIONS” below and the whole of this manual to understand this product before you start maintenance.

As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.

If you have any questions regarding this product, please contact a Brother dealer.

SAFETY INSTRUCTIONS

1. Safety indications and their meanings

This service manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.

The meanings of these indications and symbols are given below.

Indications

	DANGER	The instructions which follow this term indicate situations where failure to follow the instructions will almost certainly result in death or severe injury.
	CAUTION	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

Symbols

- 

.....This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.
(For example, the symbol at left means “beware of injury”.)
- 

.....This symbol (⊘) indicates something that you must not do.
- 

.....This symbol (●) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.
(For example, the symbol at left means “you must make the ground connection”.)

2. Notes on safety

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION

Environmental requirements



Use the sewing machine in an area which is free from sources of strong electrical noise such as high-frequency welders. Sources of strong electrical noise may cause problems with correct operation.



Any fluctuations in the power supply voltage should be within $\pm 10\%$ of the rated voltage for the machine. Voltage fluctuations which are greater than this may cause problems with correct operation.



The power supply capacity should be greater than the requirements for the sewing machine's electrical consumption. Insufficient power supply capacity may cause problems with correct operation.



The pneumatic delivery capability should be greater than the requirements for the sewing machine's total air consumption. Insufficient pneumatic delivery capability may cause problems with correct operation.



The ambient temperature should be within the range of 5°C to 35°C during use. Temperatures which are lower or higher than this may cause problems with correct operation.



The relative humidity should be within the range of 45 % to 85 % during use, and no dew formation should occur in any devices. Excessively dry or humid environments and dew formation may cause problems with correct operation.



Avoid exposure to direct sunlight during use. Exposure to direct sunlight may cause problems with correct operation.



In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet. Lightning may cause problems with correct operation.

Installation



Machine installation should only be carried out by a qualified technician.



Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.



The sewing machine weighs more than 400 kg. The installation should be carried out by two or more people.



Do not connect the power cord until installation is complete, otherwise the machine may operate if the start is pressed by mistake, which could result in injury.



Have two people present to hold the machine head with both their hands when tilting it back or returning it to its original position.



Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil under any circumstances, as they can cause vomiting and diarrhea. Keep the oil out of the reach of children.



Avoid setting up the sewing machine near sources of strong electrical noise such as high-frequency welding equipment. If this precaution is not taken, incorrect machine operation may result.

CAUTION

Sewing

- | | |
|--|---|
| <p> This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.</p> <p> The sewing machine should not be used for any applications other than sewing.</p> <p> Be sure to wear protective goggles when using the machine.
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.</p> <p> Turn off the power switch at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.</p> <ul style="list-style-type: none"> * When replacing the needle * When not using the machine and when leaving the machine unattended | <p> Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.</p> <p> Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.</p> <p> If an error occurs in machine operation, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.</p> <p> If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.</p> |
|--|---|

Cleaning

- | | |
|--|--|
| <p> Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.</p> | <p> Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil under any circumstances, as they can cause vomiting and diarrhea.
Keep the oil out of the reach of children.</p> |
|--|--|

Maintenance and inspection

- | | |
|---|---|
| <p> Disassembly, assembly, maintenance and inspection of the sewing machine should only be carried out by a qualified technician.</p> <p> Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.</p> <p> Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.</p> <ul style="list-style-type: none"> * When carrying out inspection, adjustment and maintenance * When replacing consumable parts such as the rotary hook and knife <p> Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to "0" before carrying out inspection, adjustment and repair of any parts which use pneumatic equipment.</p> | <p> If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.</p> <p> Have two people present to hold the machine head with both their hands when tilting it back or returning it to its original position.</p> <p> Use only the proper replacement parts as specified by Brother.</p> <p> If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.</p> <p> Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.</p> |
|---|---|

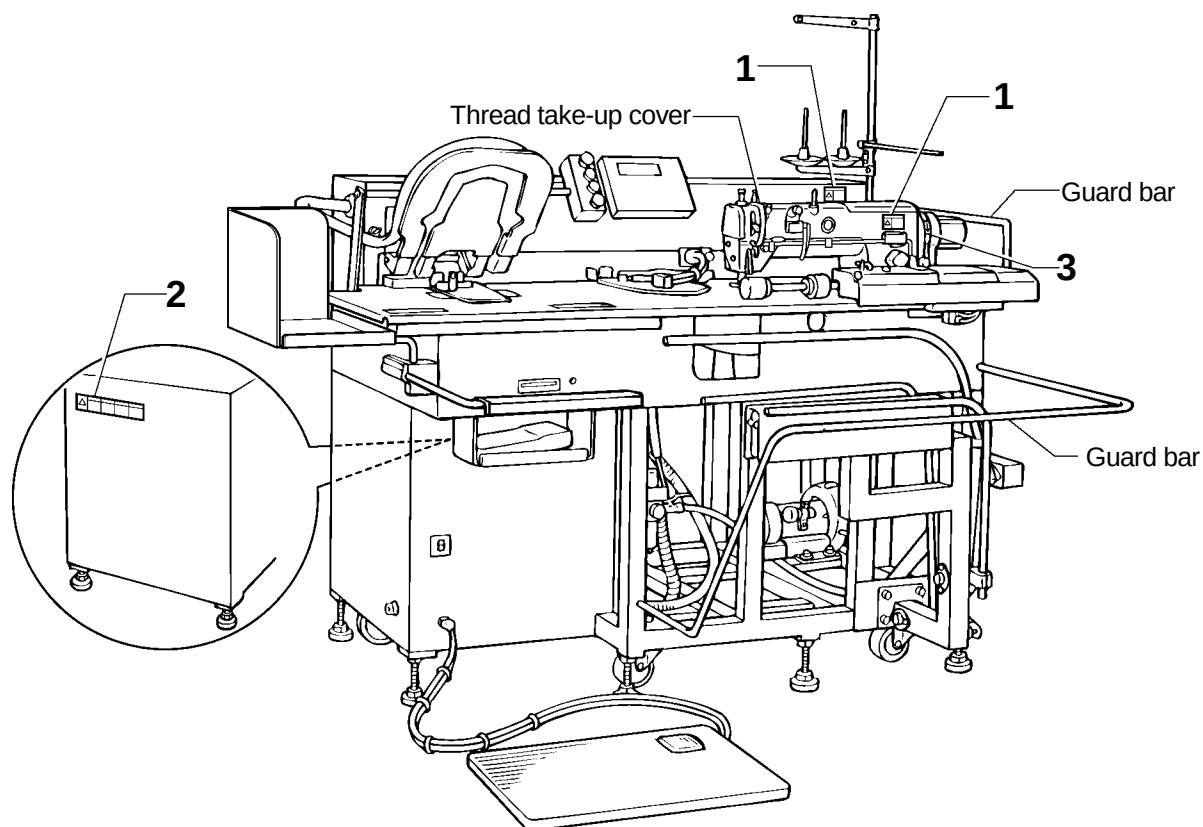
3. Warning labels

★ The following warning labels appear on the sewing machine.

Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.



Safety devices: Thread take-up cover,
Guard bar, Belt cover, etc.



1855S

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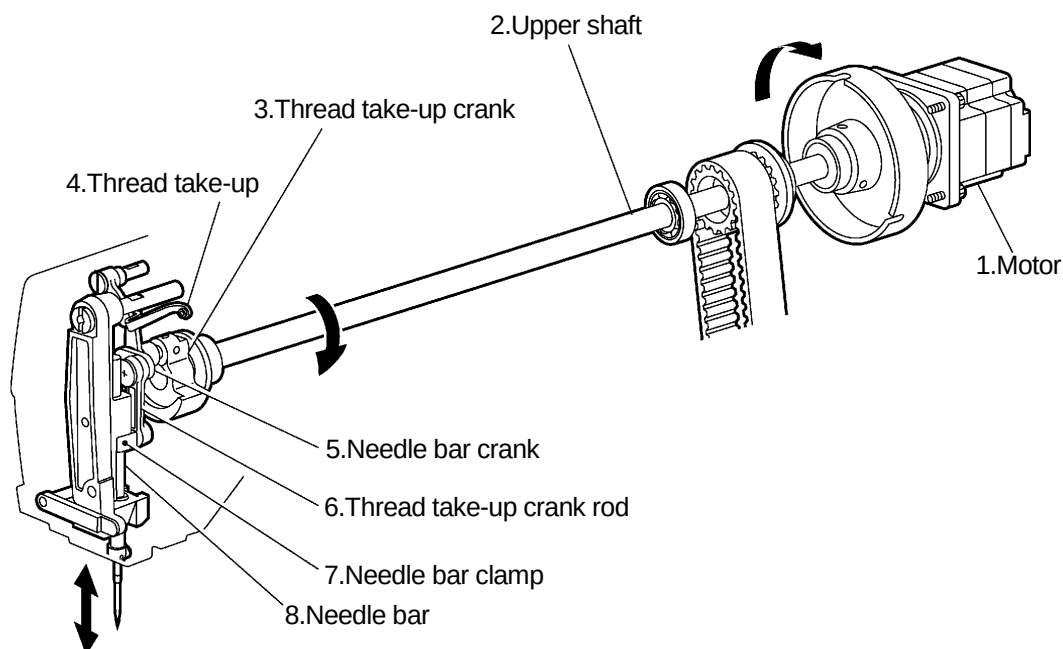
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1. MECHANICAL DESCRIPTIONS

Operate in the order of the numbers in the illustration.

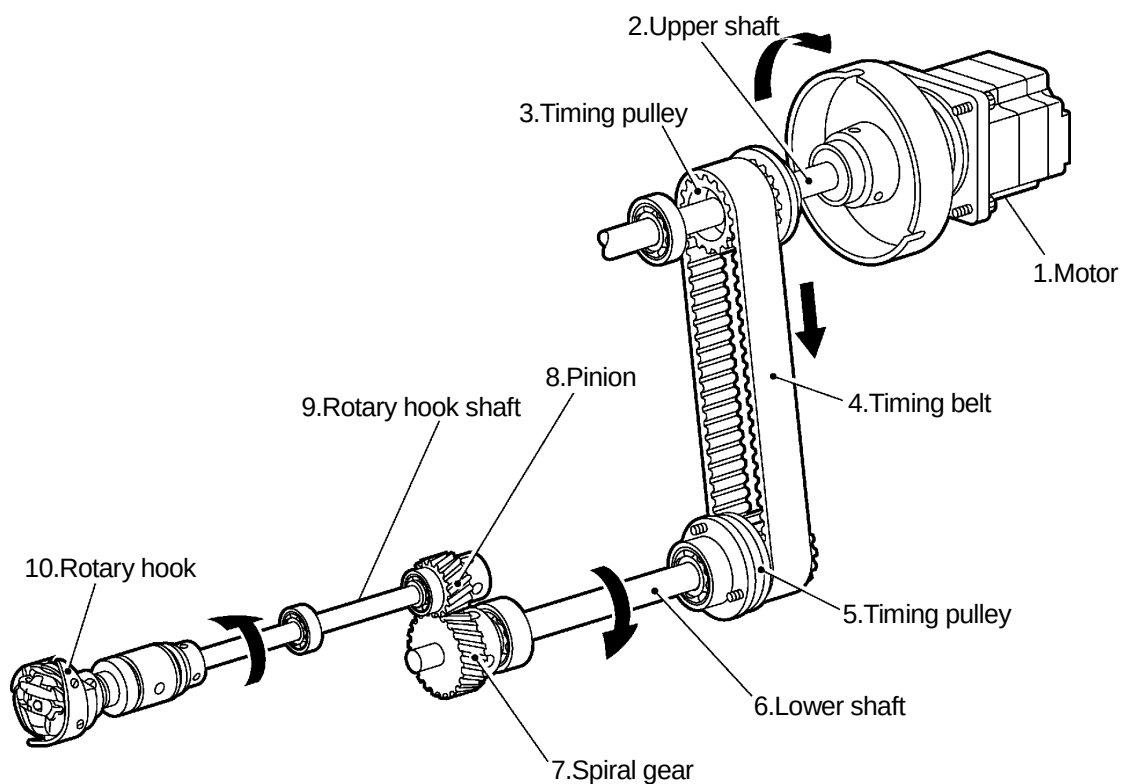
The "A", "B" and other alphabets with the numbers indicate different sequences of operation which can occur at the same time.

1-1. Upper shaft and needle bar mechanism



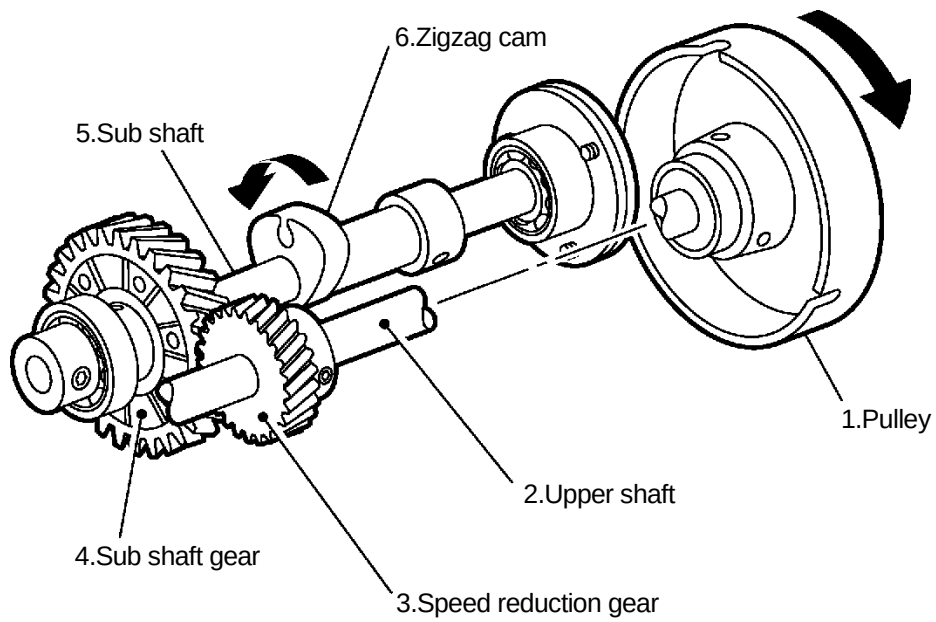
1557S

1-2. Lower shaft and rotary hook mechanism

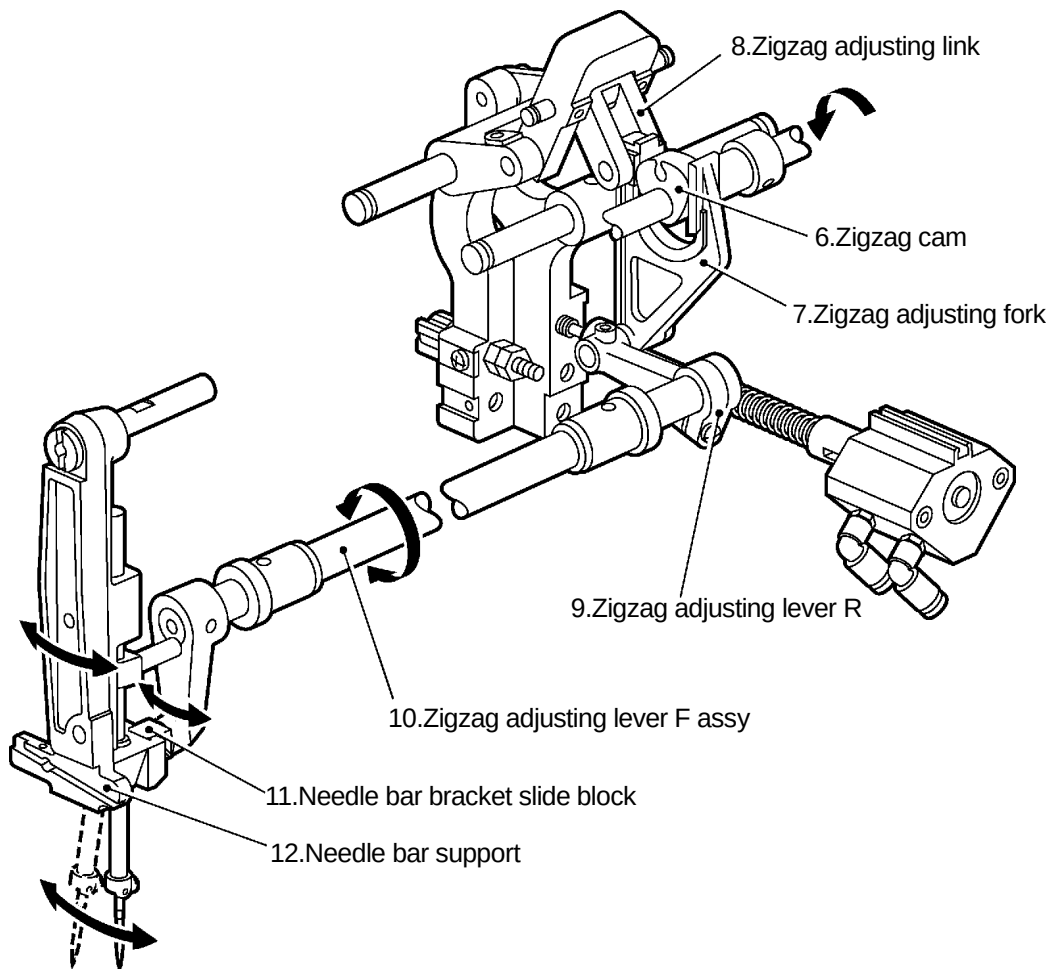


1558S

1-3. Needle zigzag mechanism



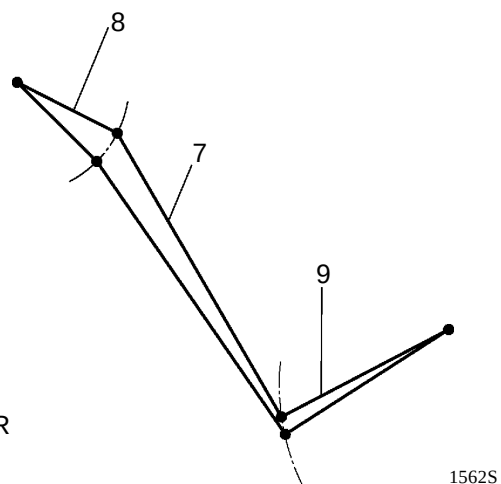
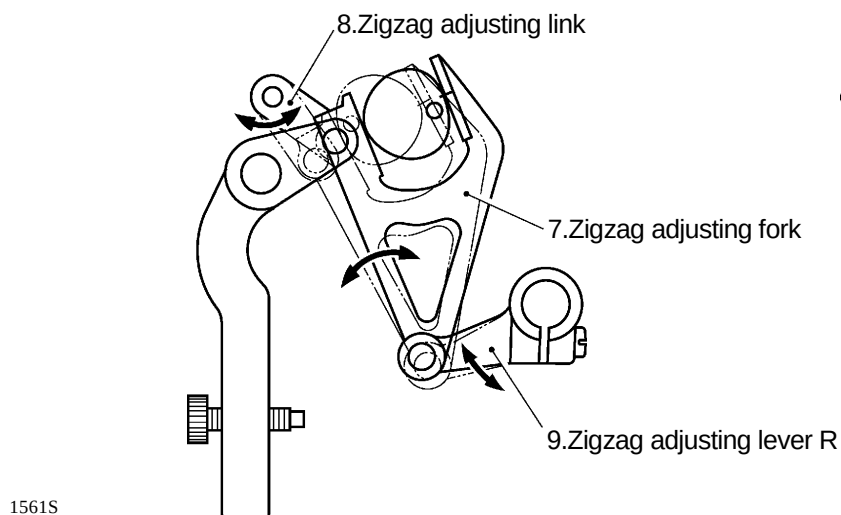
1559S



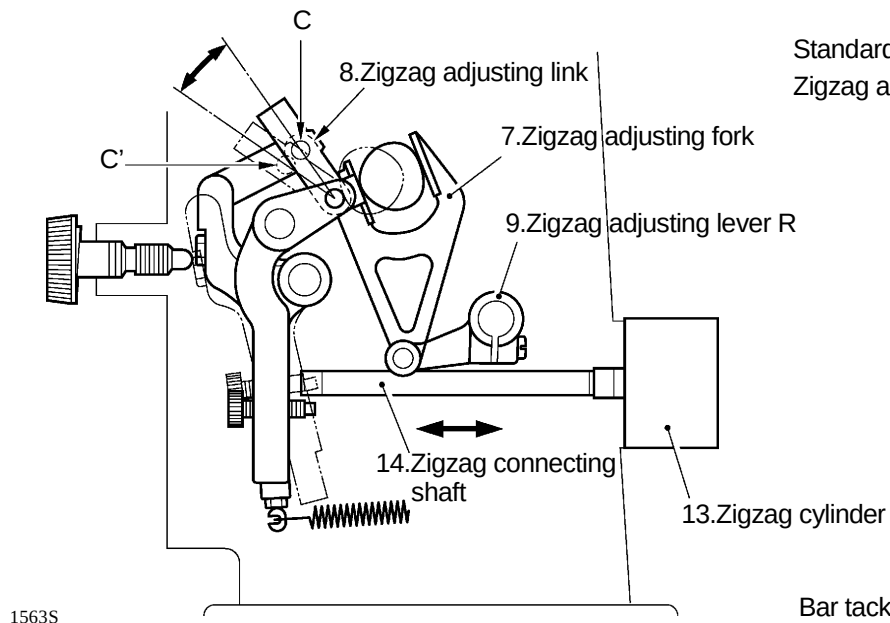
1560S

1. MECHANICAL DESCRIPTIONS

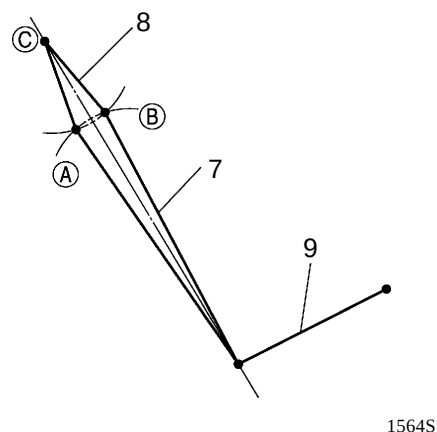
1-3-1. Zigzag generation mechanism



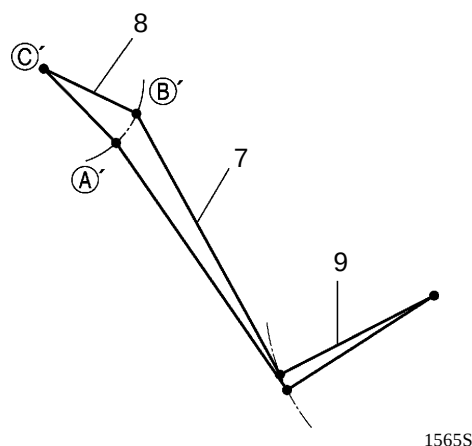
1-3-2. Standard sewing and bar tacking



Standard sewing
Zigzag adjusting lever R (9) : Not swing



Bar tacking
Zigzag adjusting lever R (9) : Swing

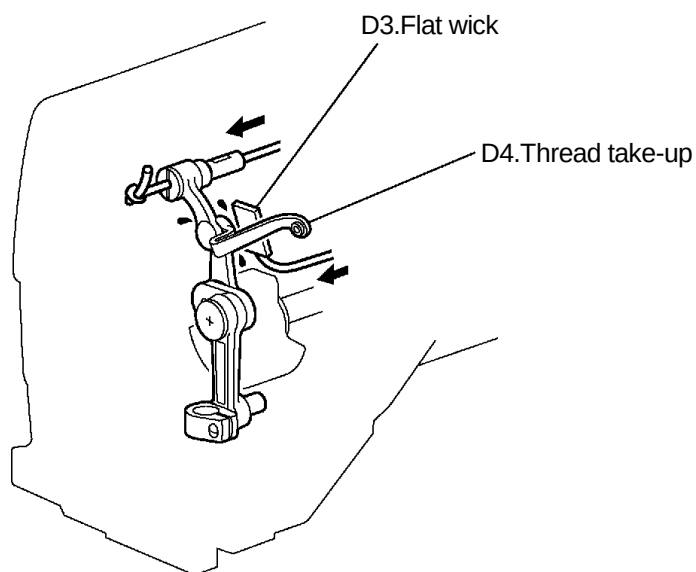
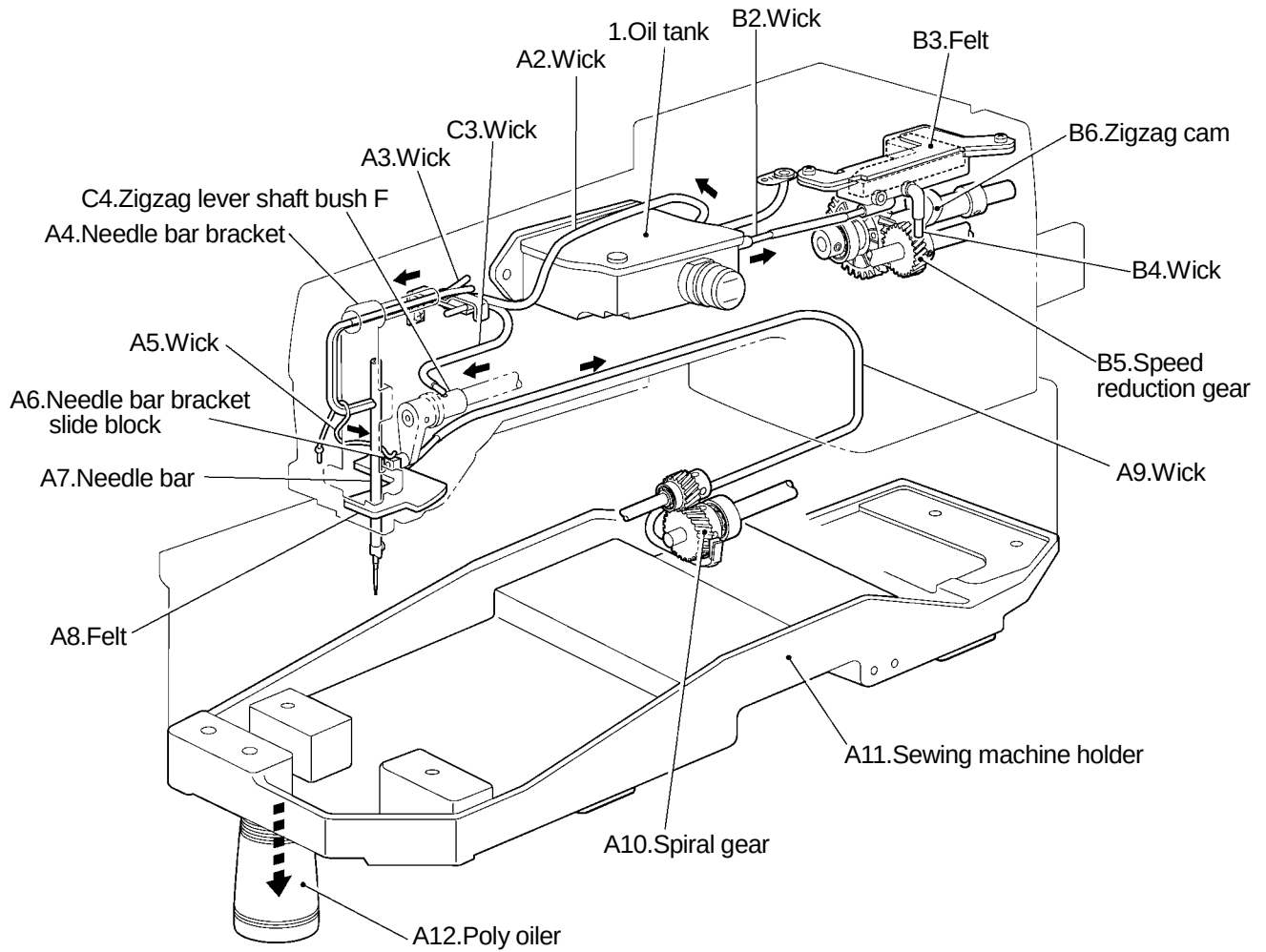


Standard sewing (Non zigzag) - Zigzag cylinder : Push
Bar tacking (Zigzag) - Zigzag cylinder : Pull

1-4. Lubrication mechanism

1-4-1. Needle bar and thread take-up lubrication

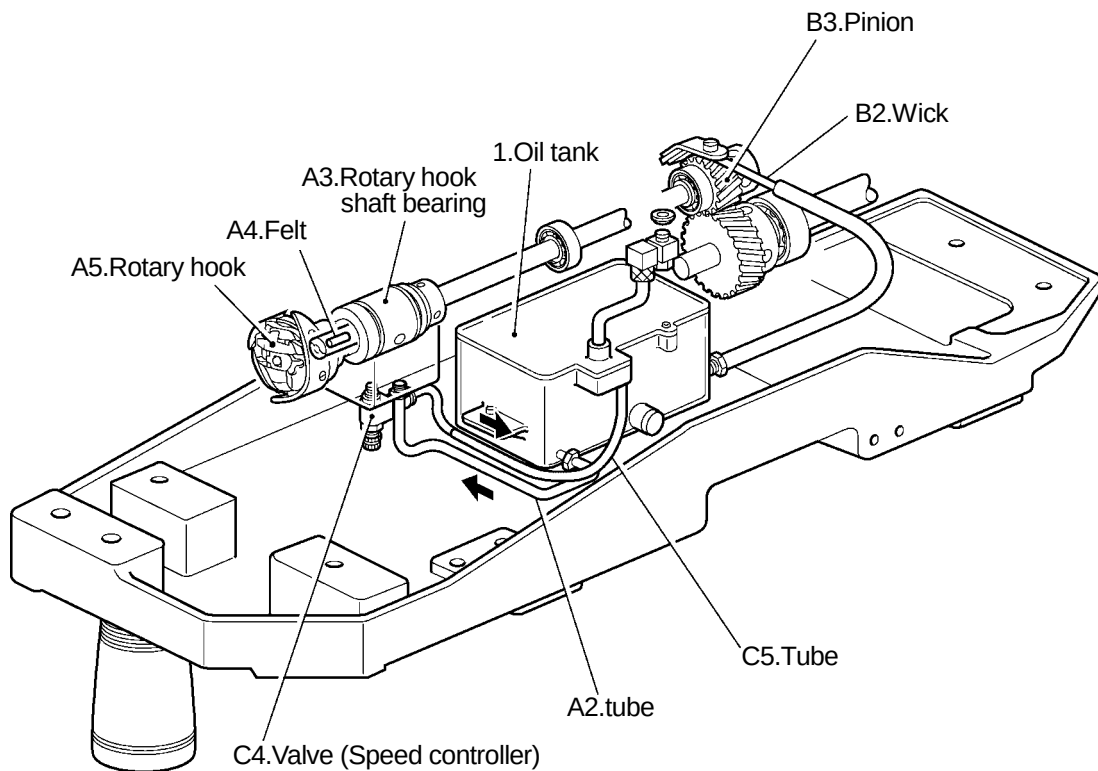
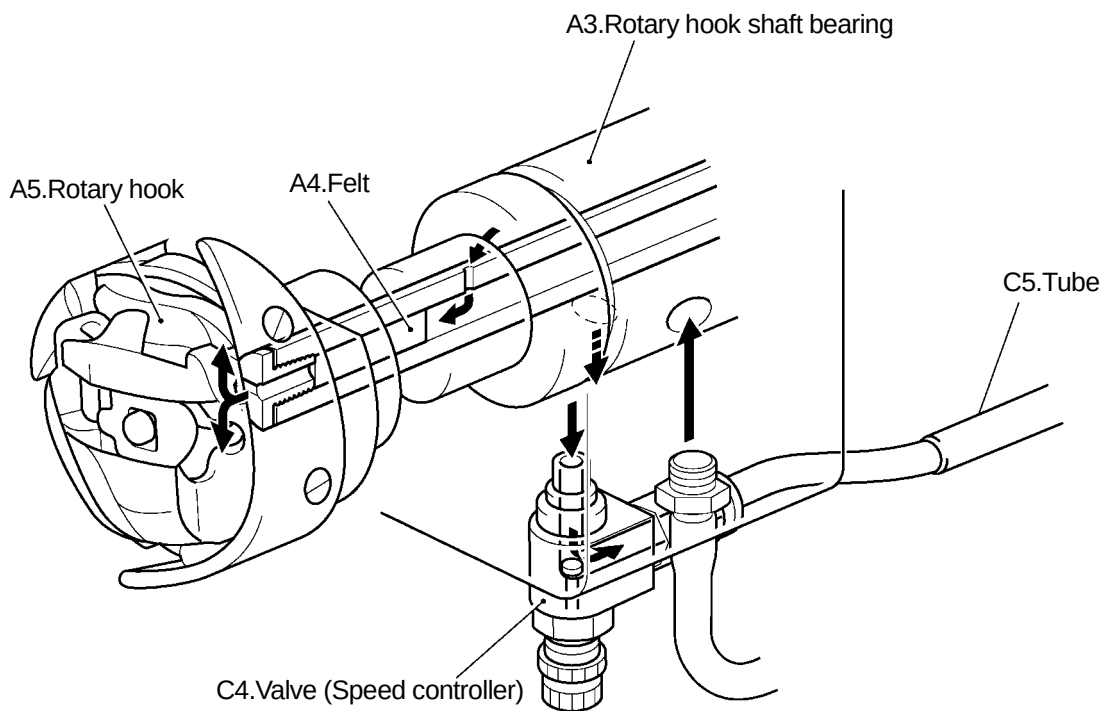
1566S



1853S

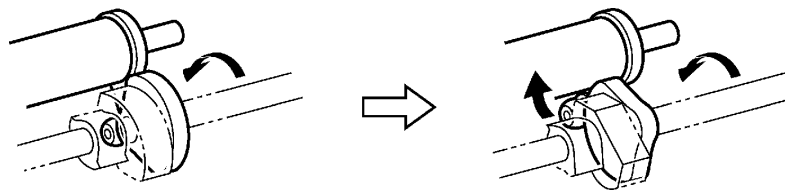
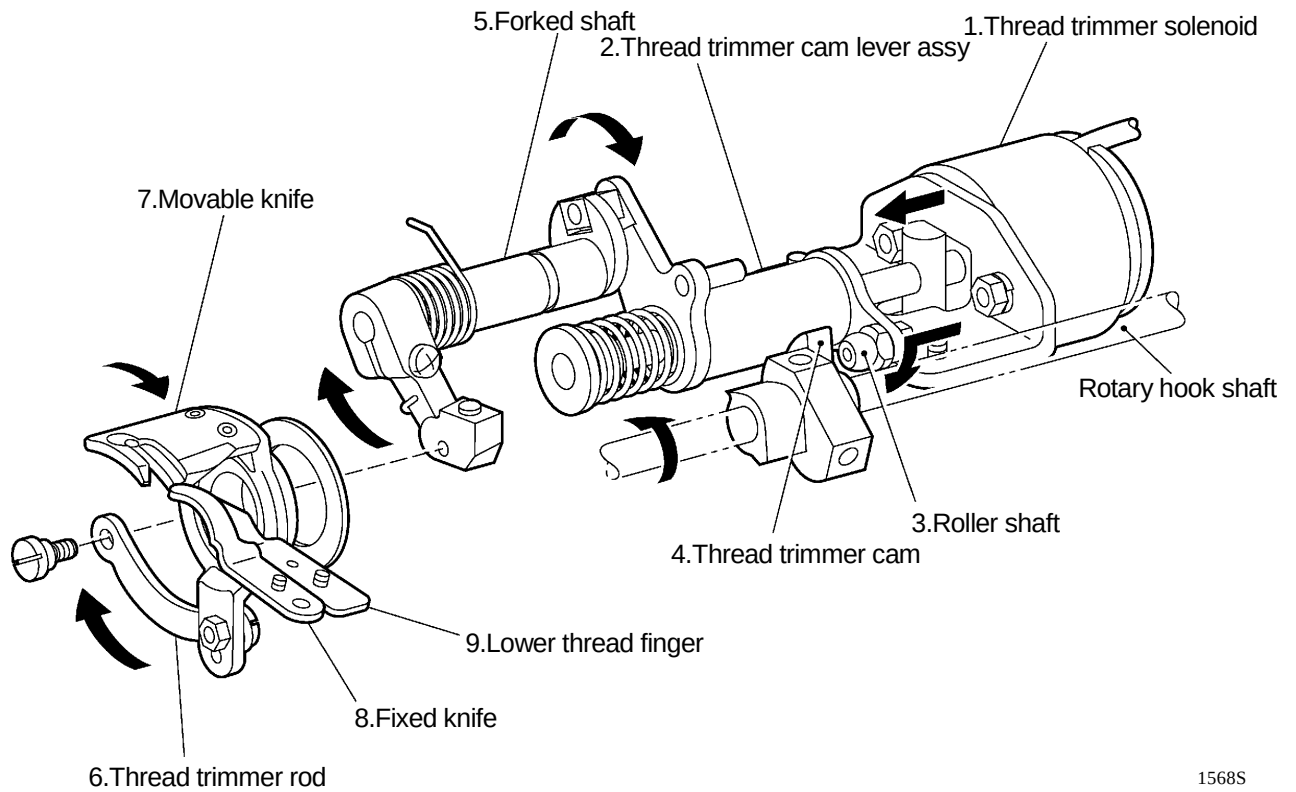
1. MECHANICAL DESCRIPTIONS

1-4-2. Rotary hook and gear lubrication



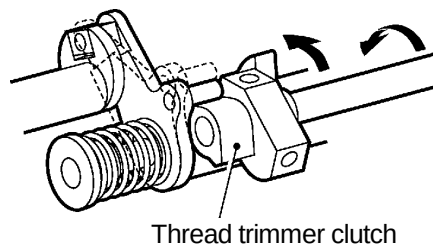
1567S

1-5. Thread trimmer



Relation between the thread trimmer cam and roller shaft

1569S



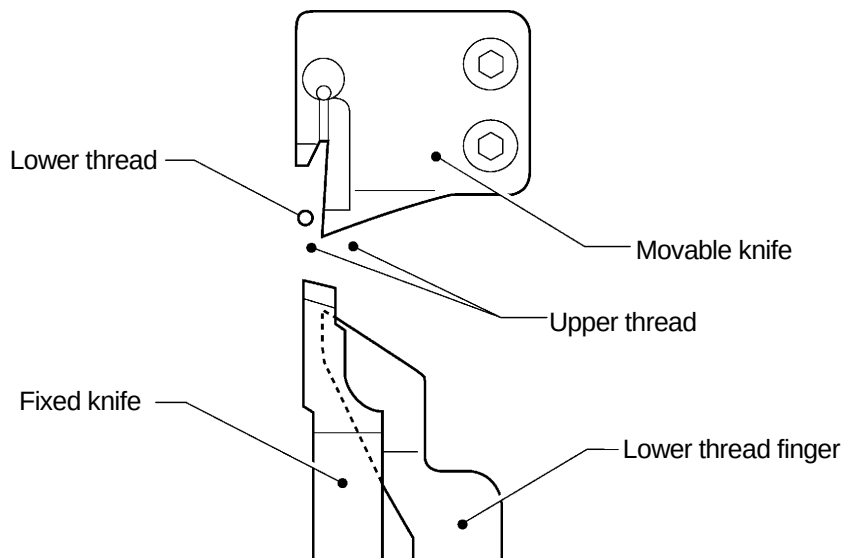
Thread trimmer safety device

If the movable knife (7) does not completely retract, the pin of the thread trimmer cam lever assy (2) and the thread trimmer clutch automatically move the movable knife (7) to a position where it will not be struck by the needle.

1570S

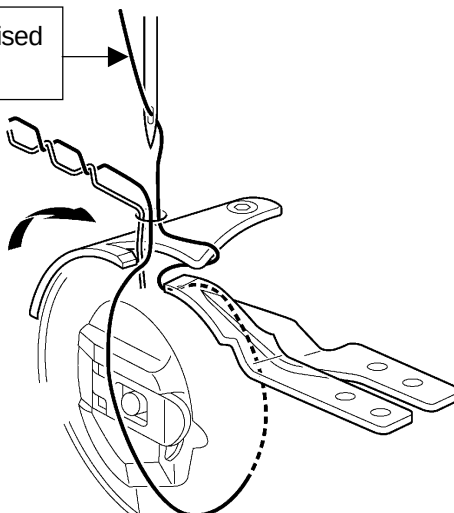
1. MECHANICAL DESCRIPTIONS

<Explanation of the upper and lower thread trimming>



1571S

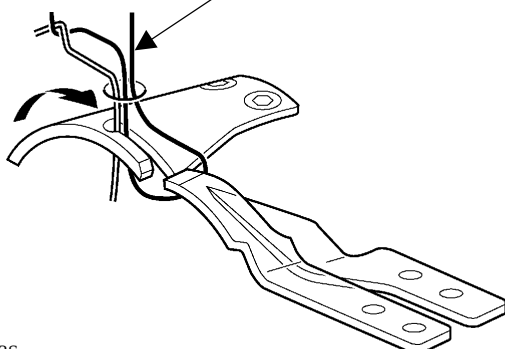
This point the needle thread take-up is raised slightly above its lowest position.



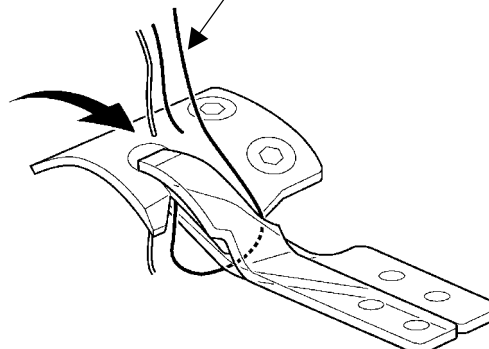
1572S

When the movable knife is spreading the needle thread, the tension release relieves the needle thread tension to prevent excessive tension and to enable the needle thread to be extended smoothly. The length of thread forming the loop made by the movable knife determines the length of thread remaining from the needle tip and bobbin when thread trimming is complete, and affects stitch formation at the beginning of the next sewing procedure.

The needle thread take-up approaches the top of its stroke.

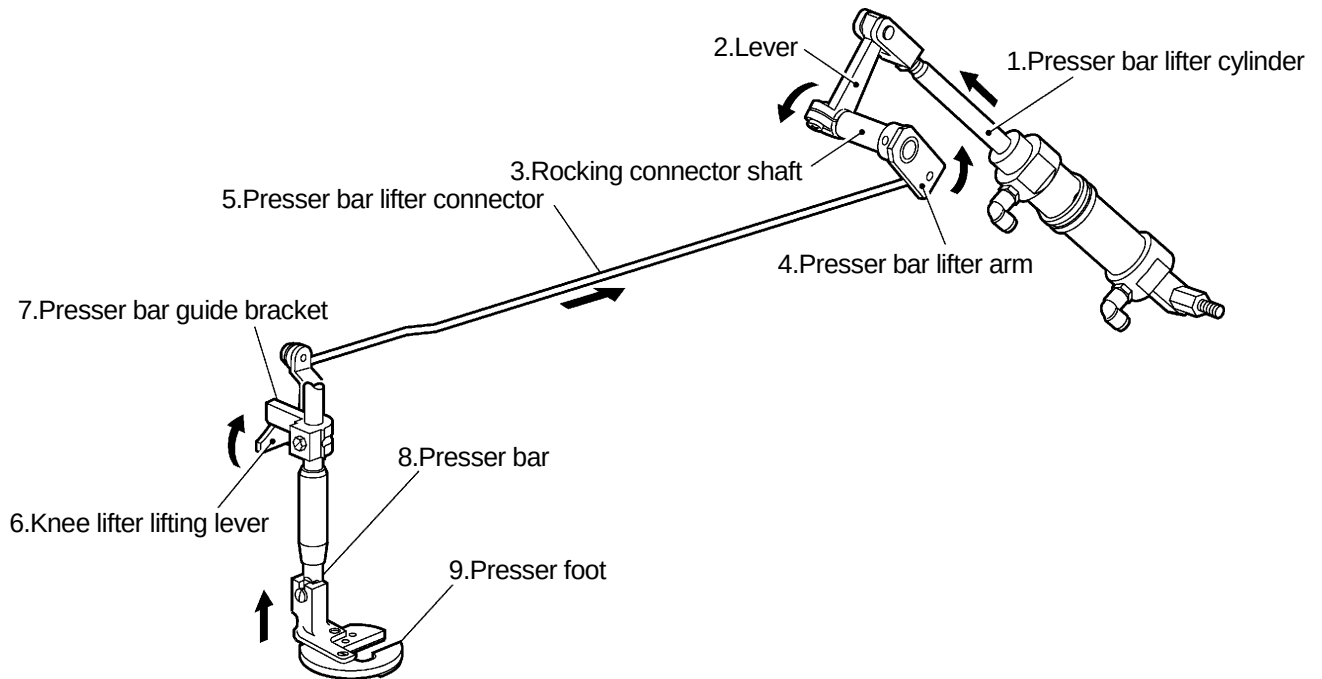


1573S



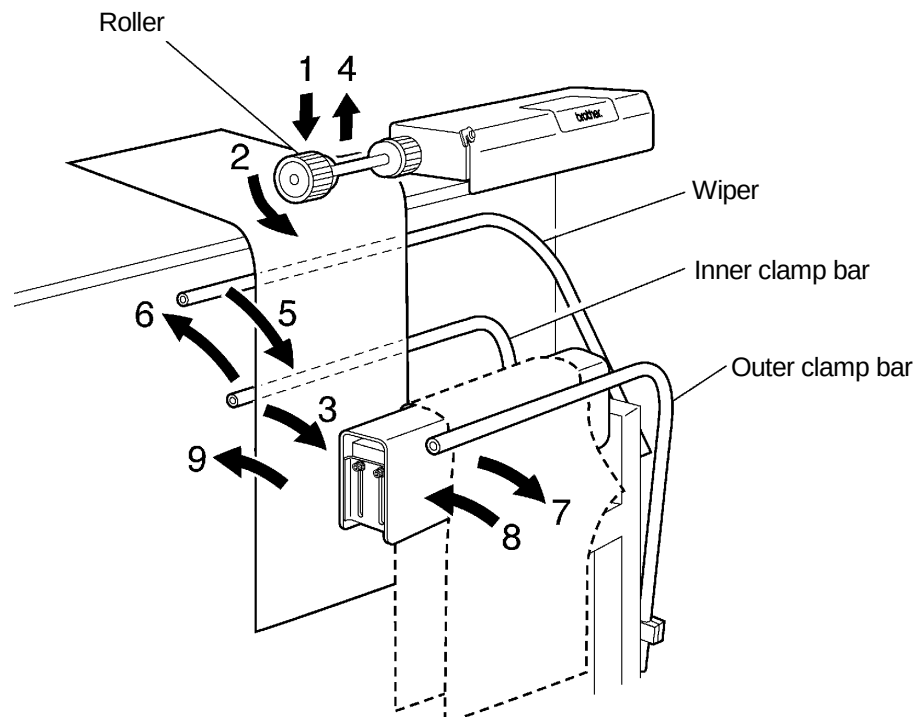
1574S

1-6. Presser bar lifter



1575S

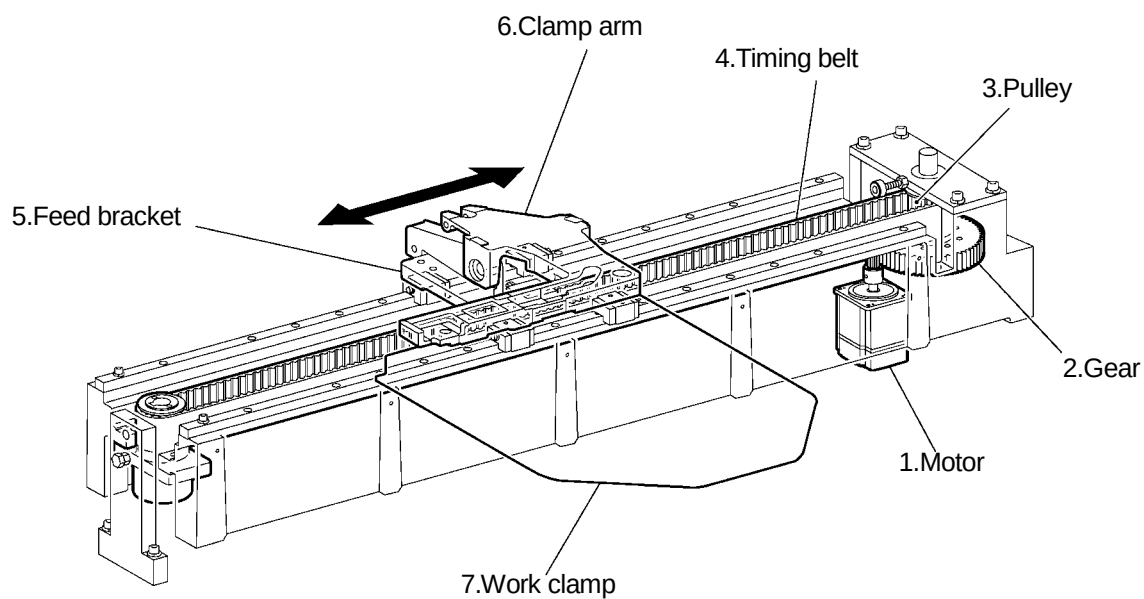
1-7. Stacker



1576S

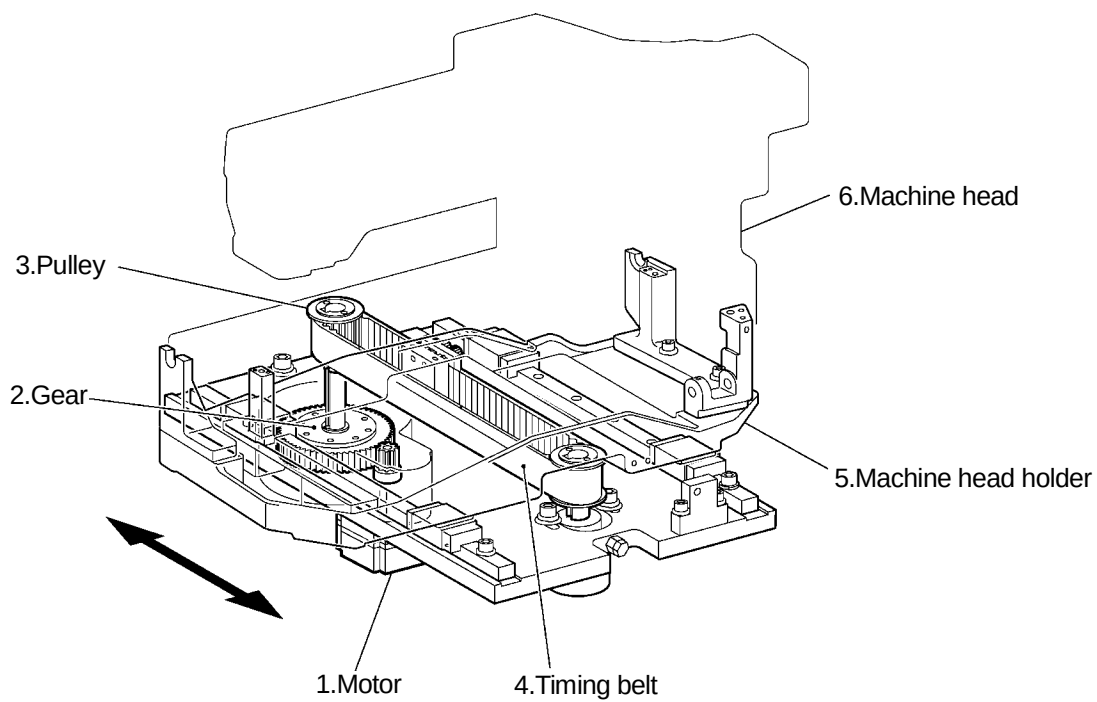
1-8. Feed guide mechanism

<X direction>



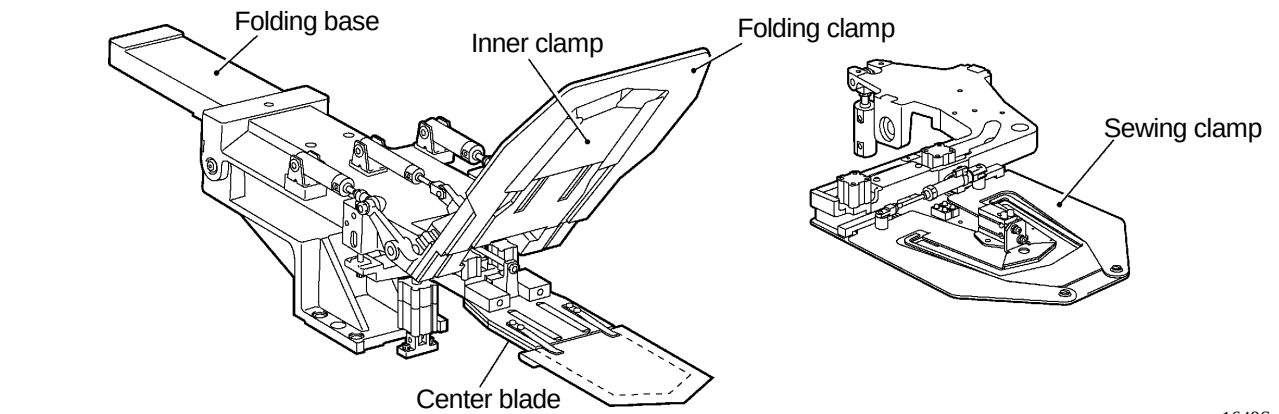
1577S

<Y direction>

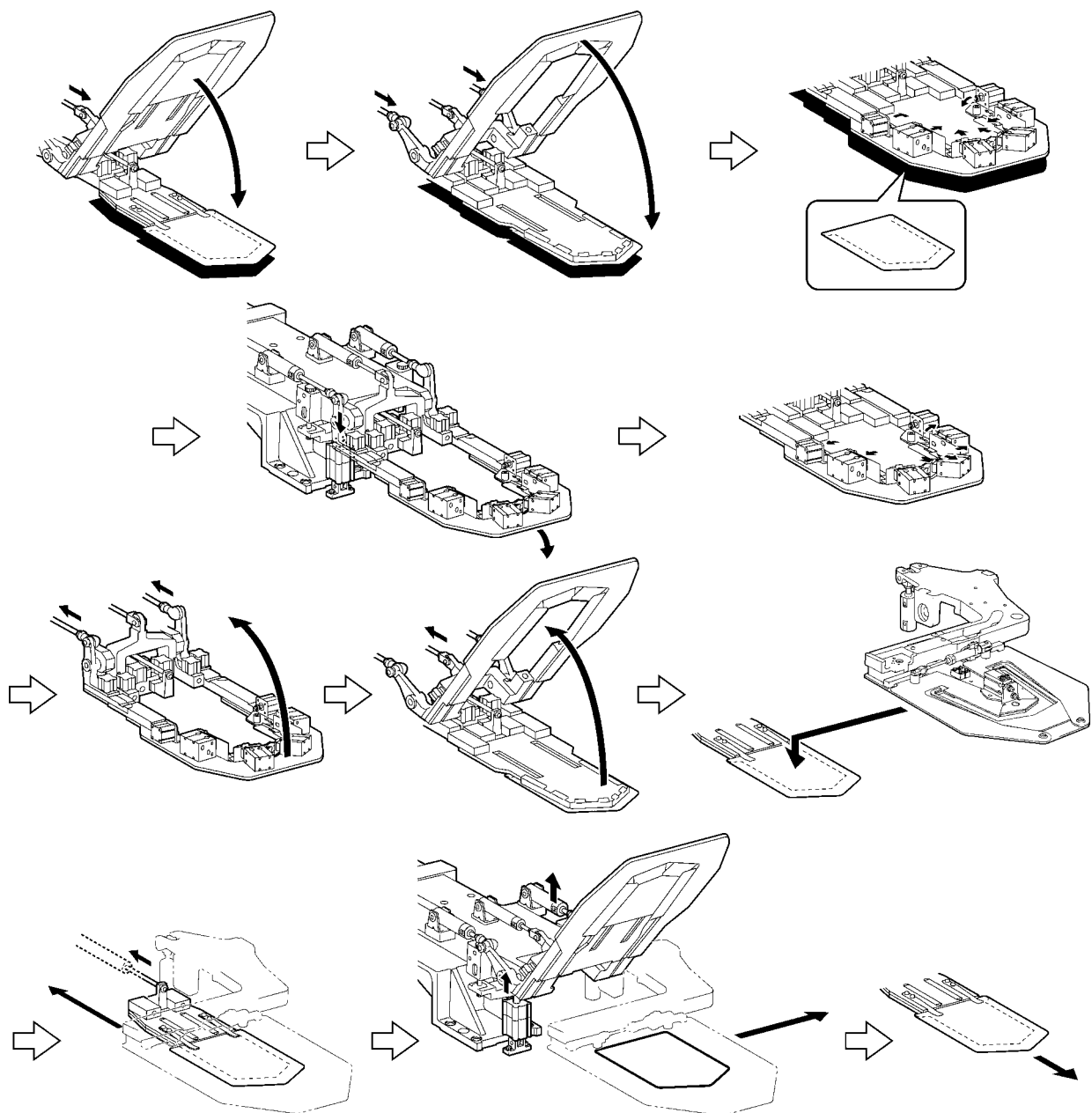


1578S

1-9. Folding mechanism

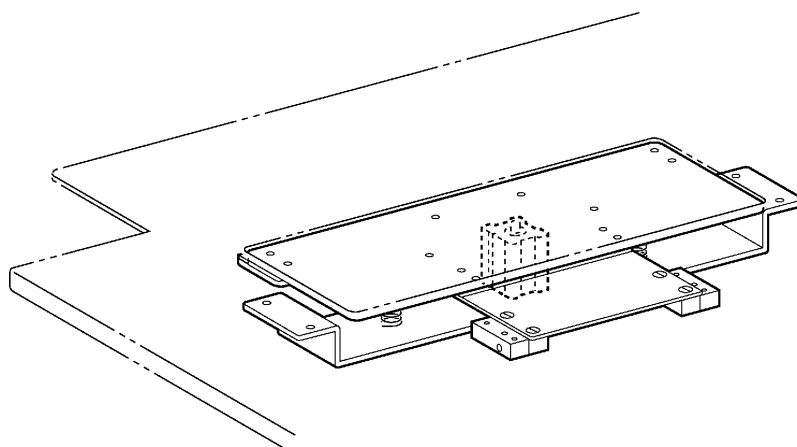


1648S

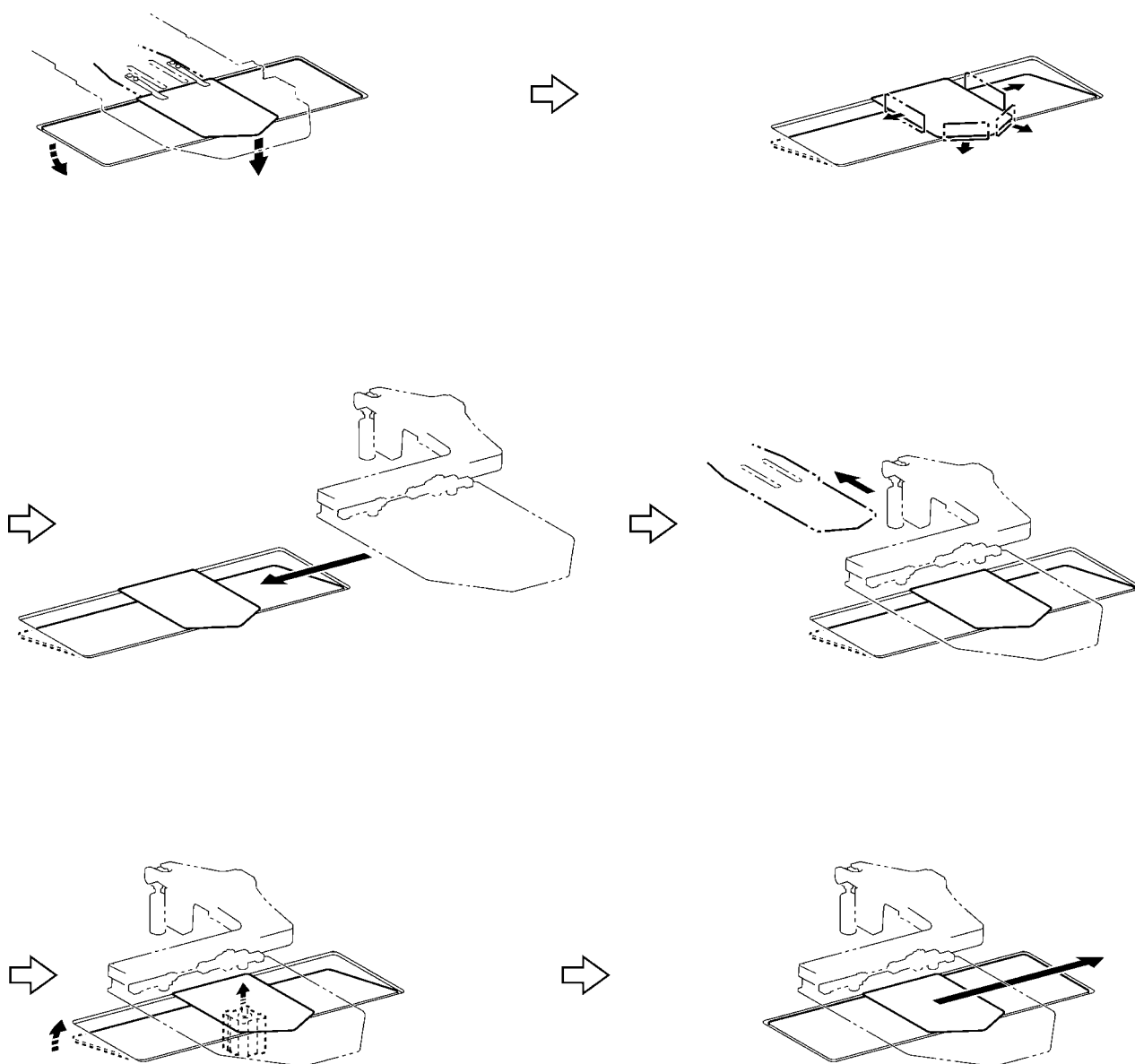


1649S

1-10. Rise-and-fall equipment of slide plate

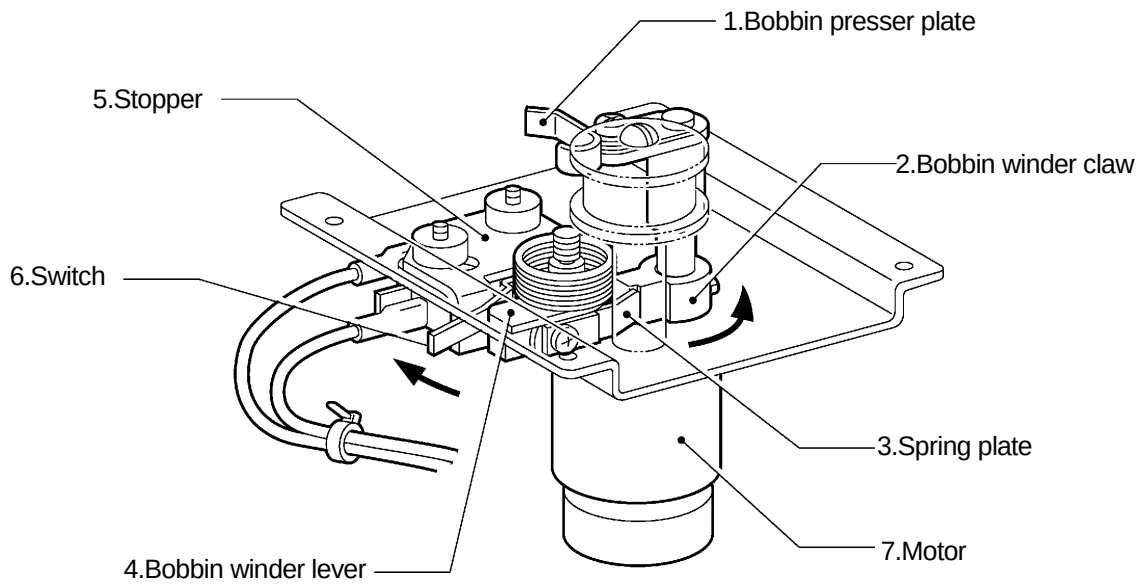


1650S



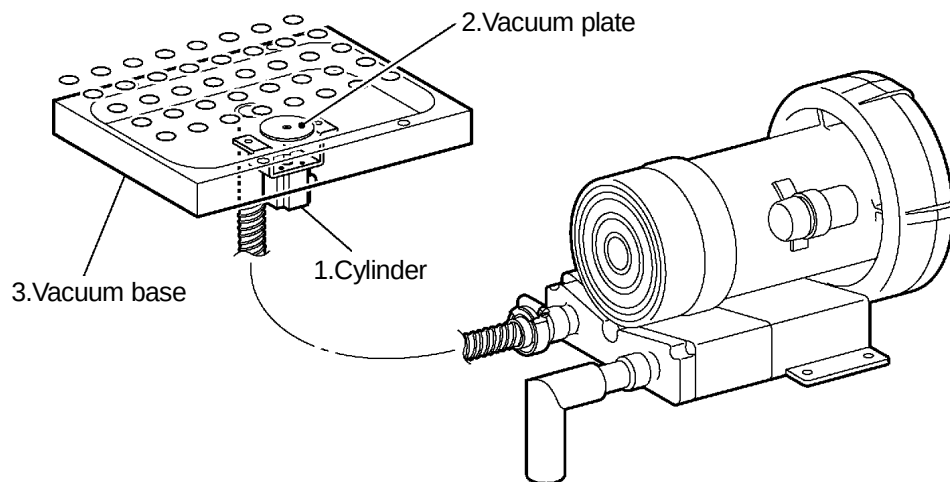
1651S

1-11. Bobbin winder mechanism

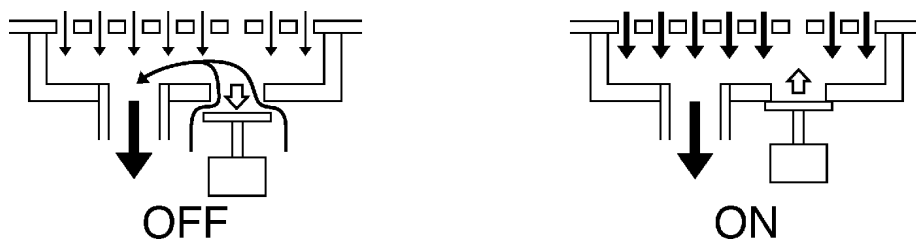


1652S

1-12. Suction (Vacuum) mechanism



1653S



1654S

2. BEFORE DISASSEMBLY AND ADJUSTMENT

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION



Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.



Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.



Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife.



Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to "0" before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.



If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this could cause the machine head to topple over, which may result in personal injury or damage to the machine.



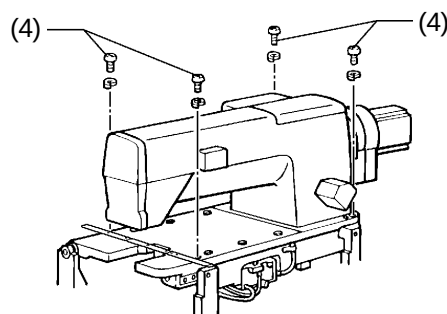
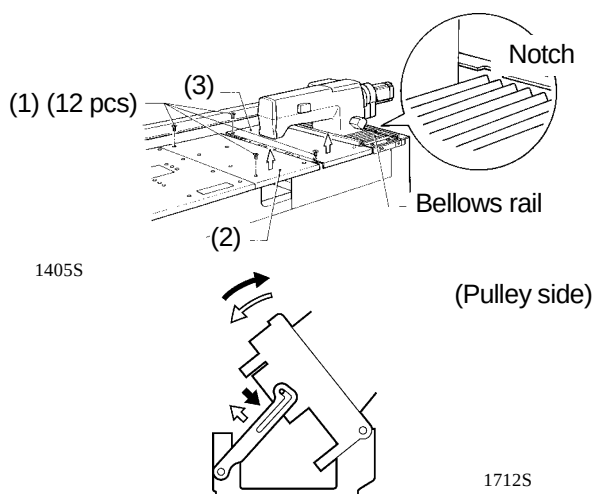
Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.



If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

2-1. Basic operation

<Tilt and return machine head>



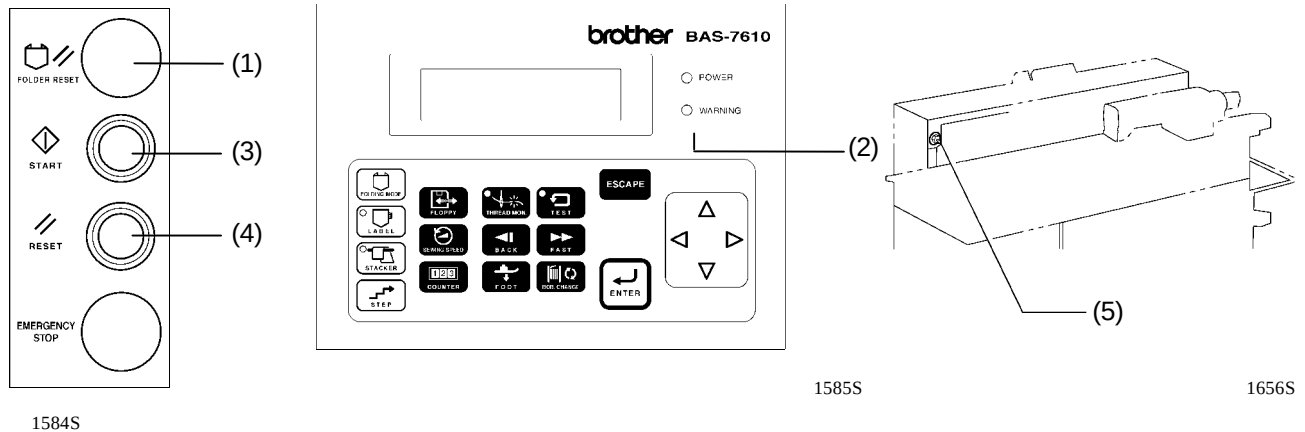
Disassemble each part in order of the numbers.

Adjust the position of the machine head so that it is aligned with the notch in the bellows rail.

If you wish to keep the machine head in the raised position, insert the head support lever securely into the hinge lever support shaft.

Always check that the head support lever and the hinge lever support shaft are meshed.

Pull the machine head down toward you gently, remove the head support lever from the hinge lever support shaft, and then gently lower the machine head.



<Starting>

Operate in order of the air cock, the power switch, the FOLDER RESET switch (1).
The sewing machine detects the home position and stop at the stand-by position.

<Countermeasure of starting error>

E-510	The needle bar is in positions other than an upper needle position at the time of a start. (After the FOLDER RESET switch (1) was pushed.)
Needle bar → Needle highest position (The position which a WARNING lamp stops blinking.) Push the RESET switch (4). → An error display is canceled. Push the START switch (3). → The sewing machine detects the home position and stop at the stand-by position.	
E-820	Air is not supplied. Air lock switch (5) is OFF. (After the power switch is ON.)
Air pressure is weak. → Air pressure is strengthened. (Refer to instruction manual.) The air cock has closed. → Open Air chuck switch (5) is OFF. → Turn ON Push the RESET switch (4) → An error display is canceled. Push the FOLDER RESET switch (1). → The sewing machine detects the home position and stop at the stand-by position.	
E-830	The X-right over travel sensor operated.
E-840	The X-left over travel sensor operated.
E-850	The Y-upper over travel sensor operated.
E-860	The Y-lower over travel sensor operated.
(After the power switch is ON.)	
Turn OFF the power switch. Return the sewing clamp and machine head into the sewing area. Turn ON the power switch.	

2-2. Disassembling and assembling for transfer through narrow doors

Machine dimensions

Depth : 1,432 mm (except stacker guard)

Width : 2,148 mm

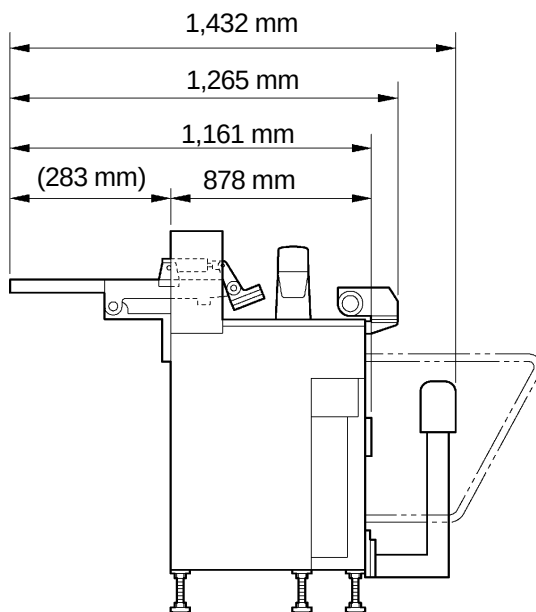
Height : 1,240 mm (except spool stand)

By removing each unit, it is possible to make a depth size small.

Remove stacker : 1,265 mm

Remove stacker roller : 1,161 mm

Remove folding base : 878 mm

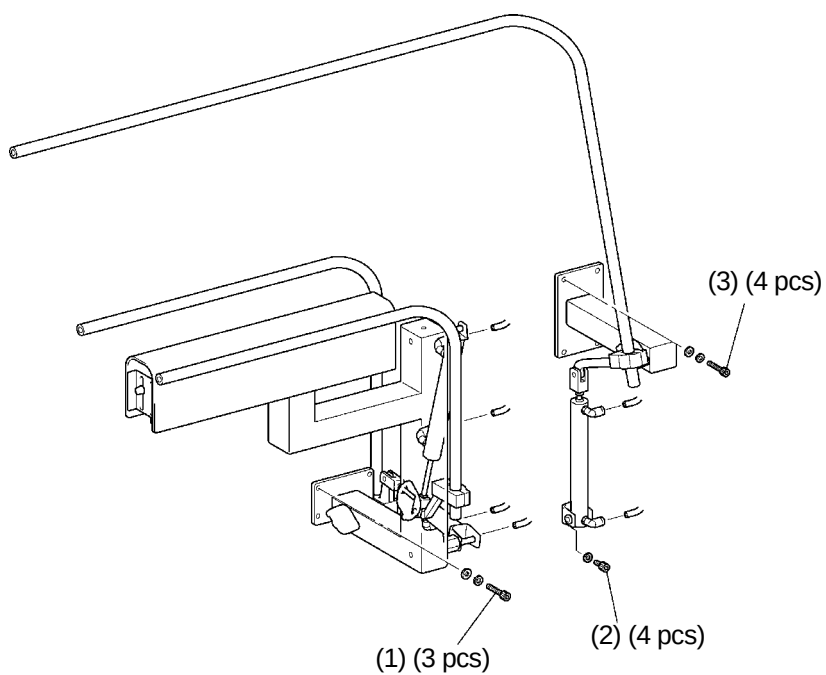


1657S

<Chips of removing air tubes>

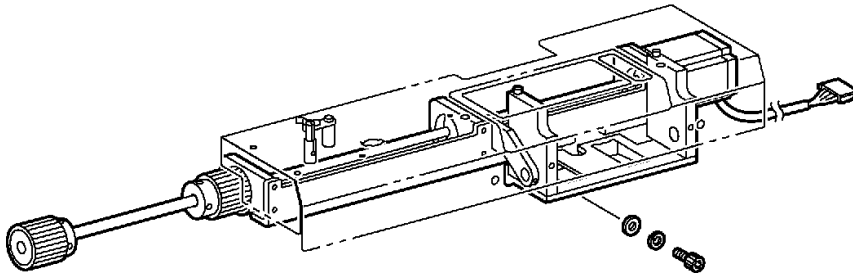
Mark air tubes to prevent misconnection.

<Removing stacker>



1658S

<Removing stacker roller>



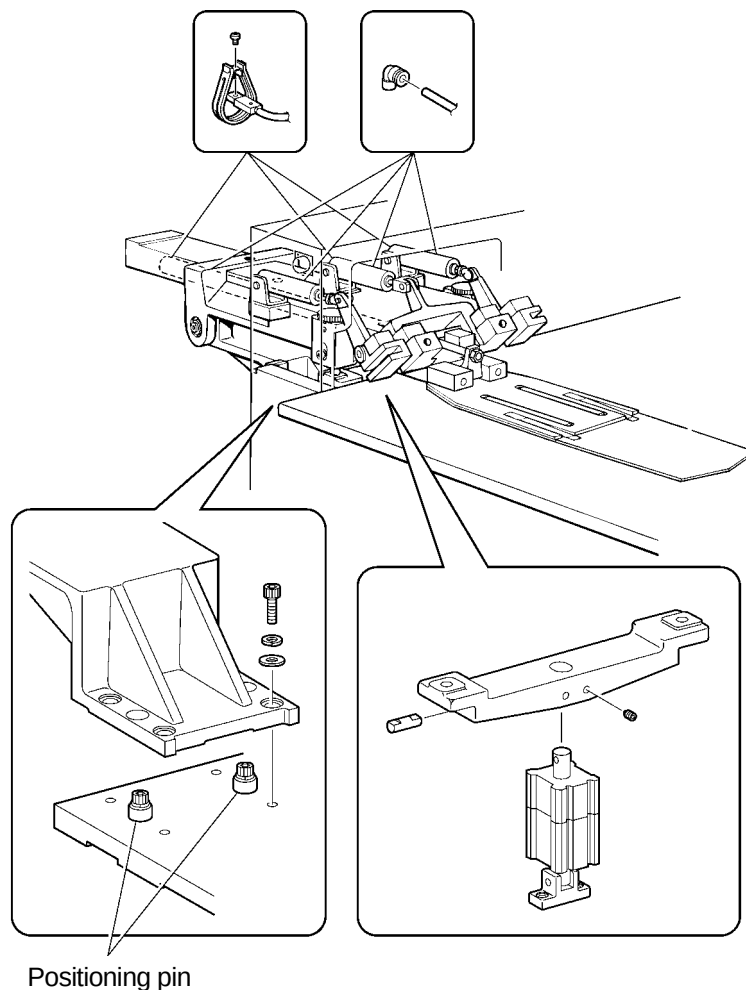
1659S

<Removing folding base>

- * Carry this out only at the last and final operation.
Carry out the operation carefully and correctly with two personnel or more.
Work is done by removing a rear cover and a side cover.

Note

Never loosen two socket bolts of two positioning pins on the right and left sides during this operation, or reproducibility will be lost.



1660S

3. DISASSEMBLY

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION



Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.



Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.



Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife.



Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to "0" before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.



If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this could cause the machine head to topple over, which may result in personal injury or damage to the machine.

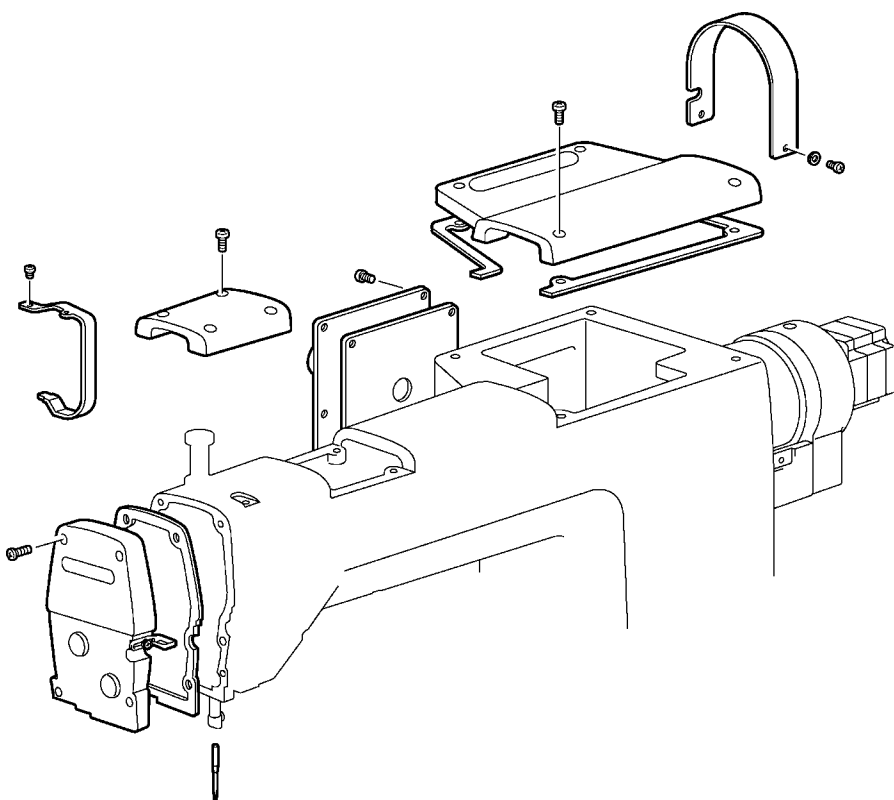


Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.



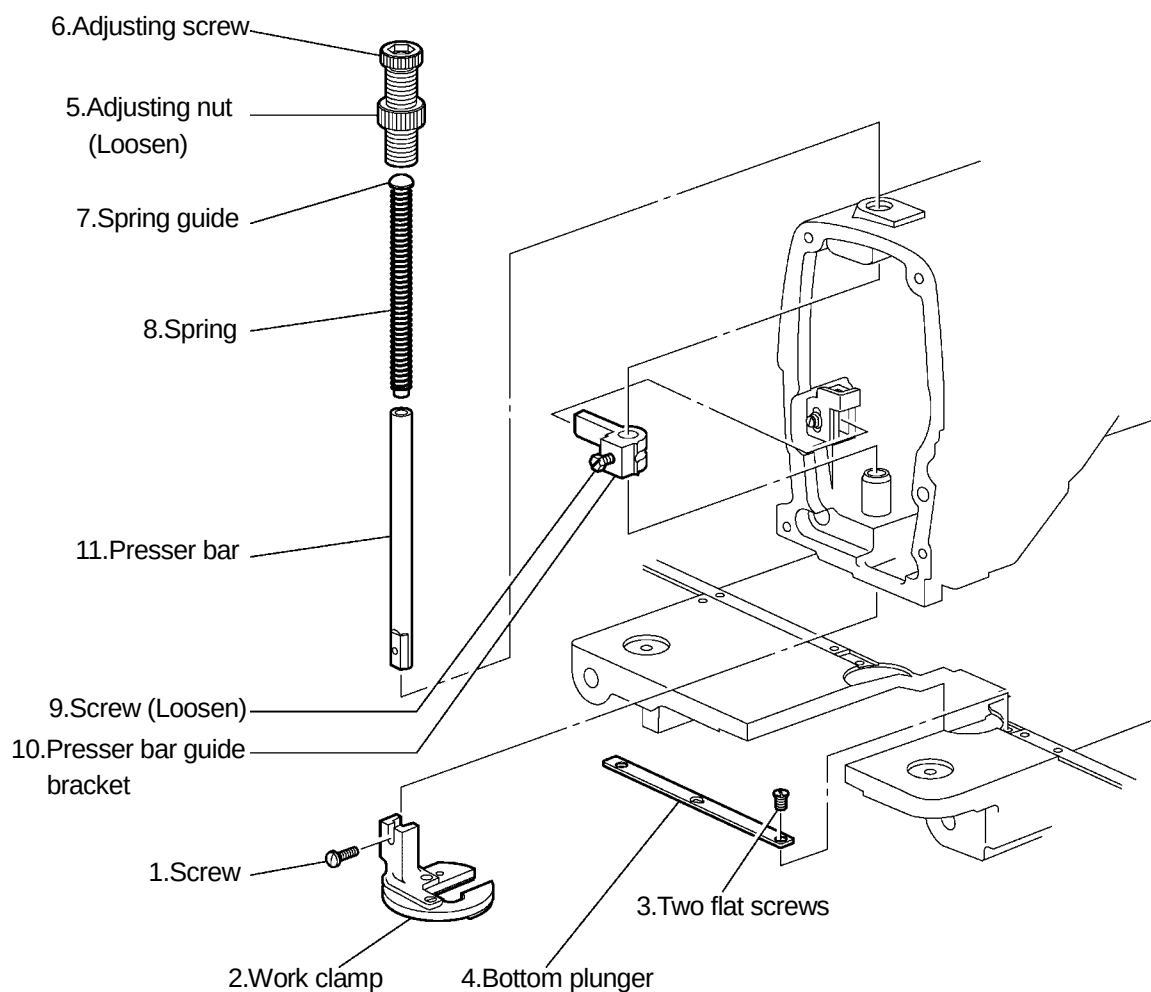
If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

3-1. Cover



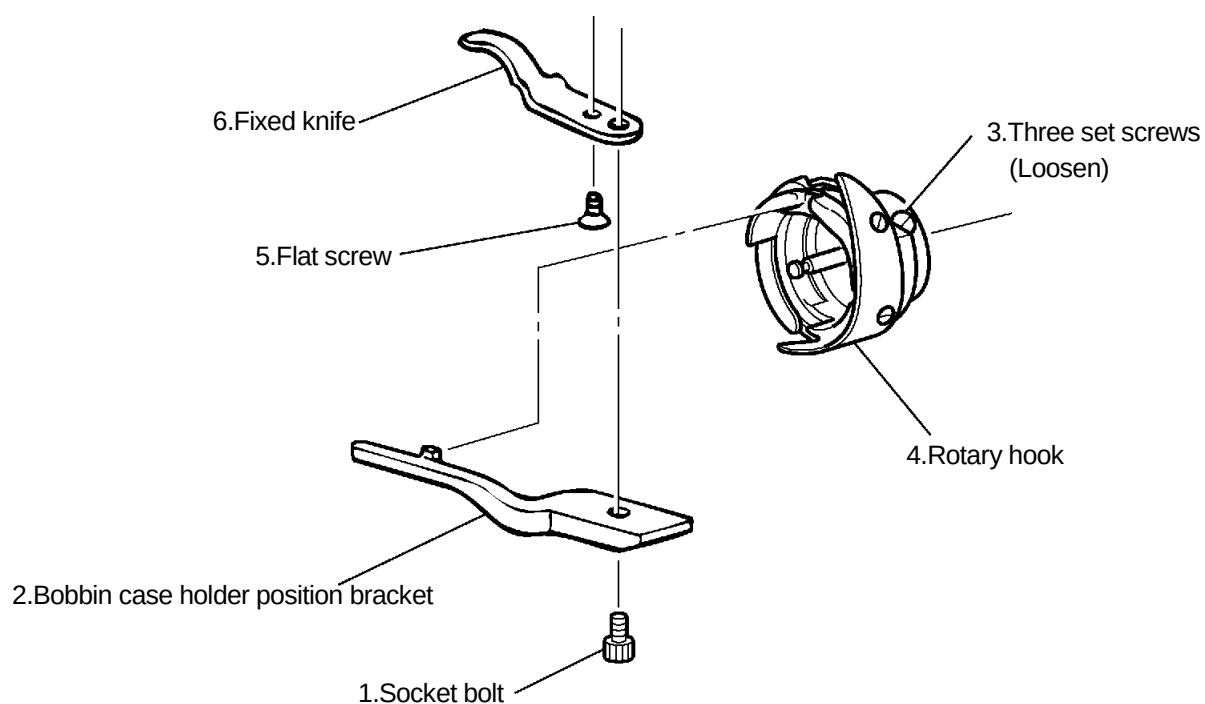
1661S

3-2. Presser foot mechanism



1662S

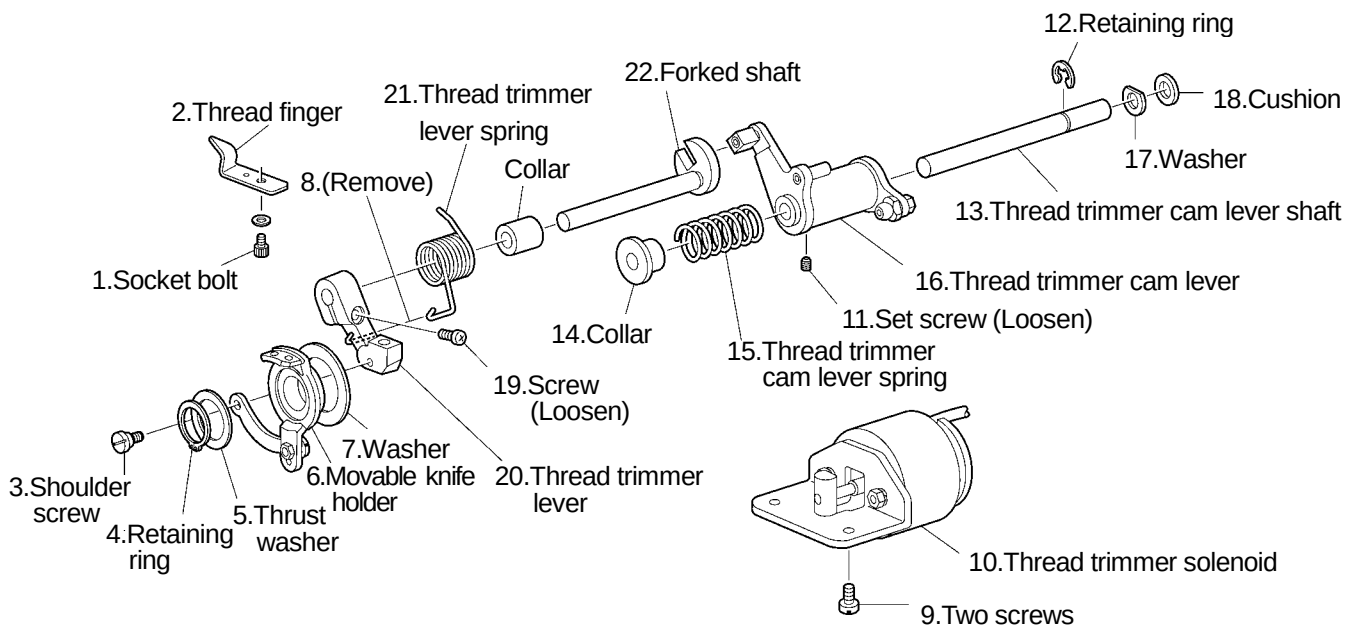
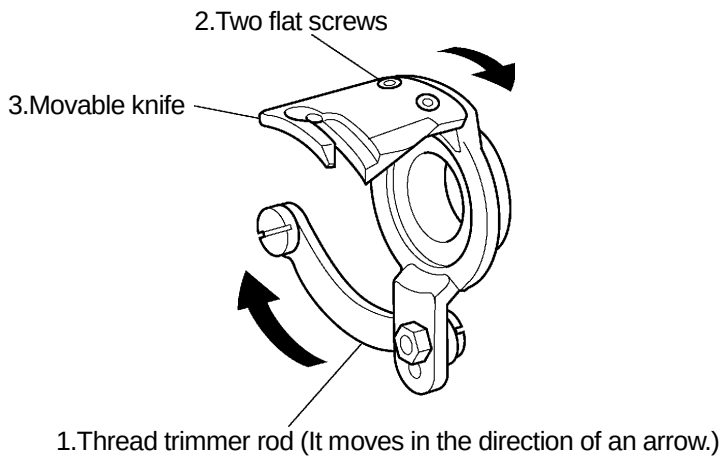
3-3. Rotary hook and fixed knife



1663S

3-4. Movable knife and thread trimmer

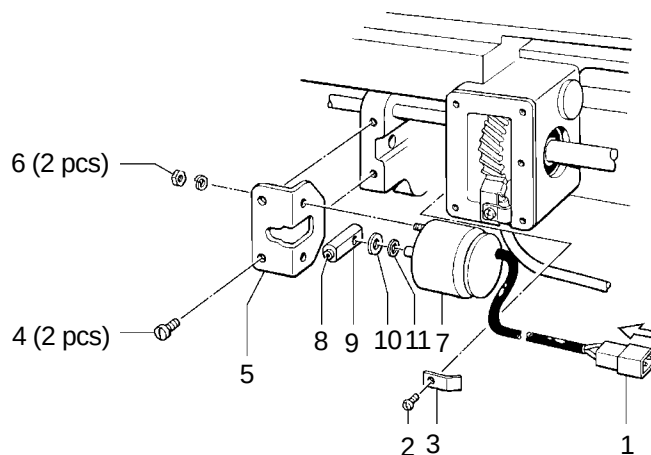
1664S



1665S

<Removing thread trimmer solenoid>

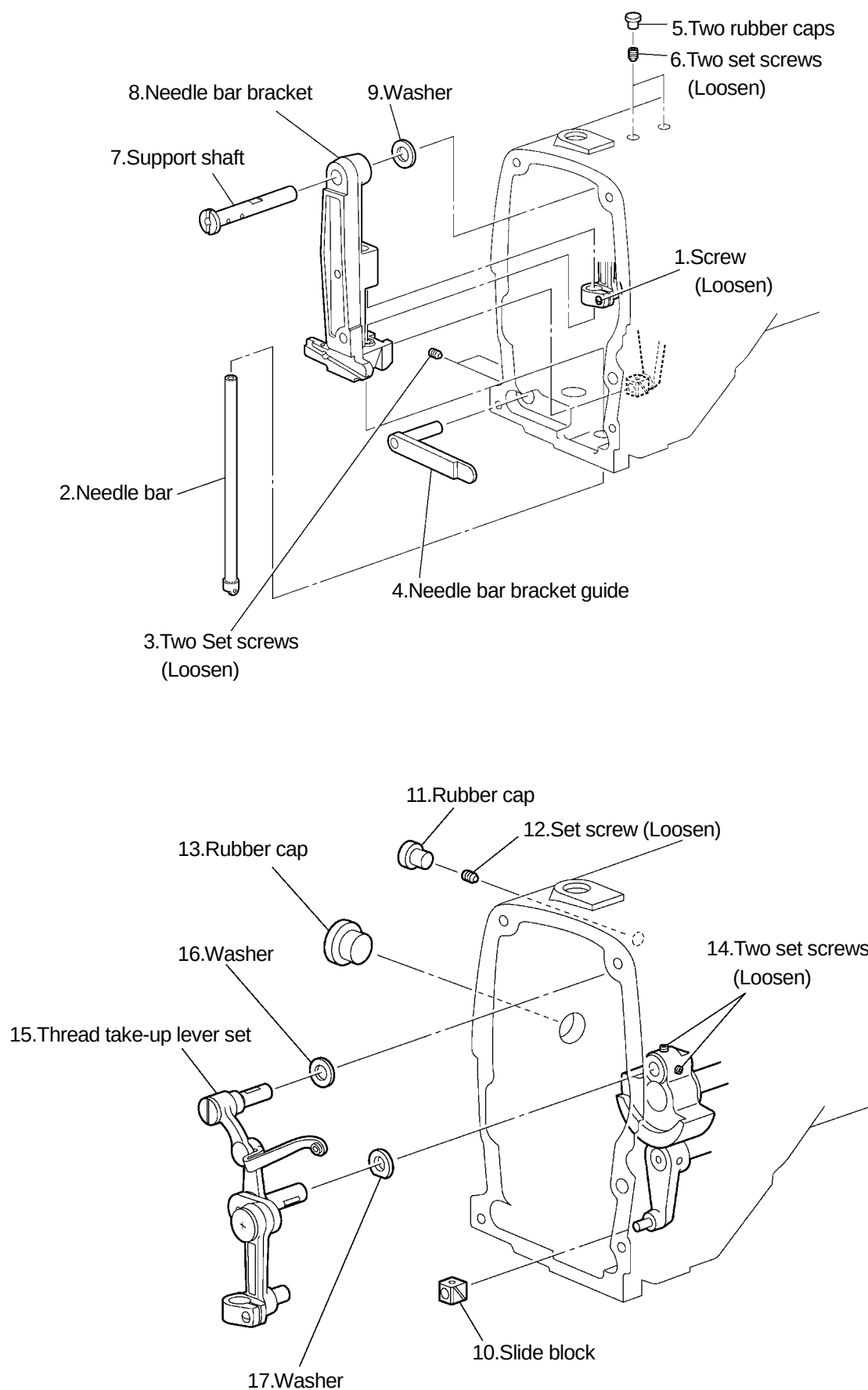
When disconnecting the solenoid cords, remember where they are attached.



1412S

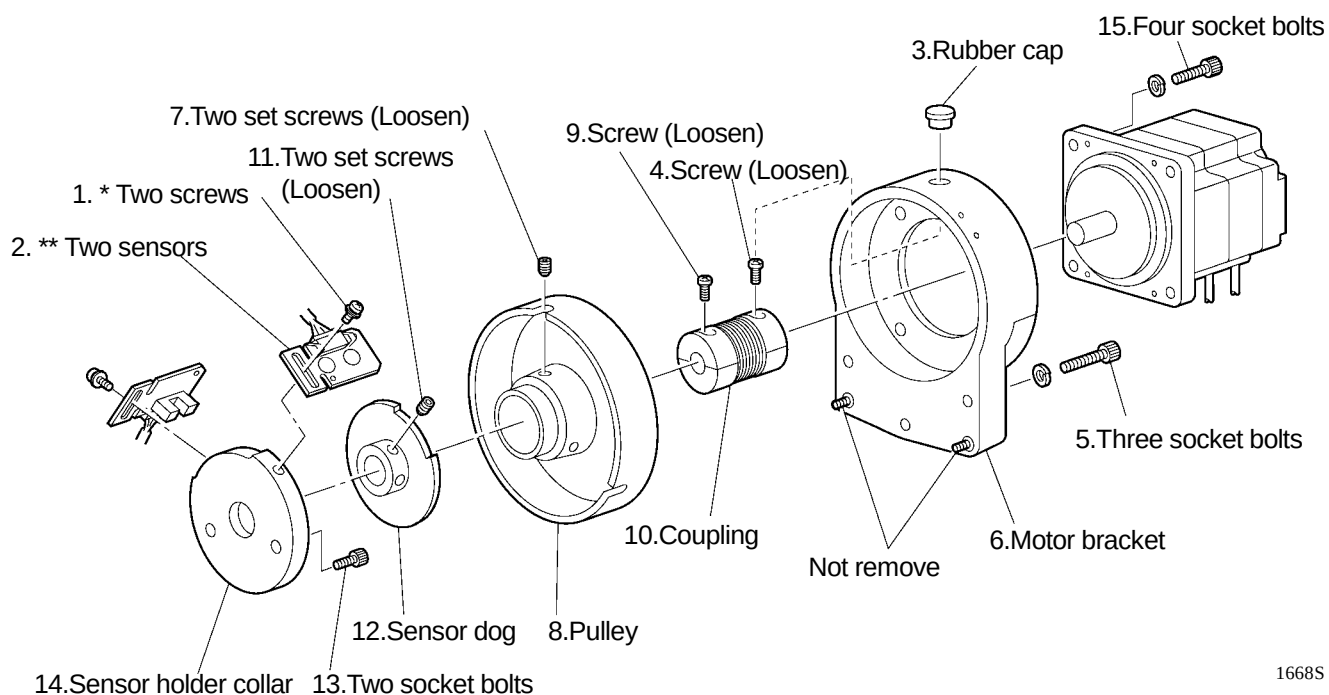
1666S

3-5. Needle bar



1667S

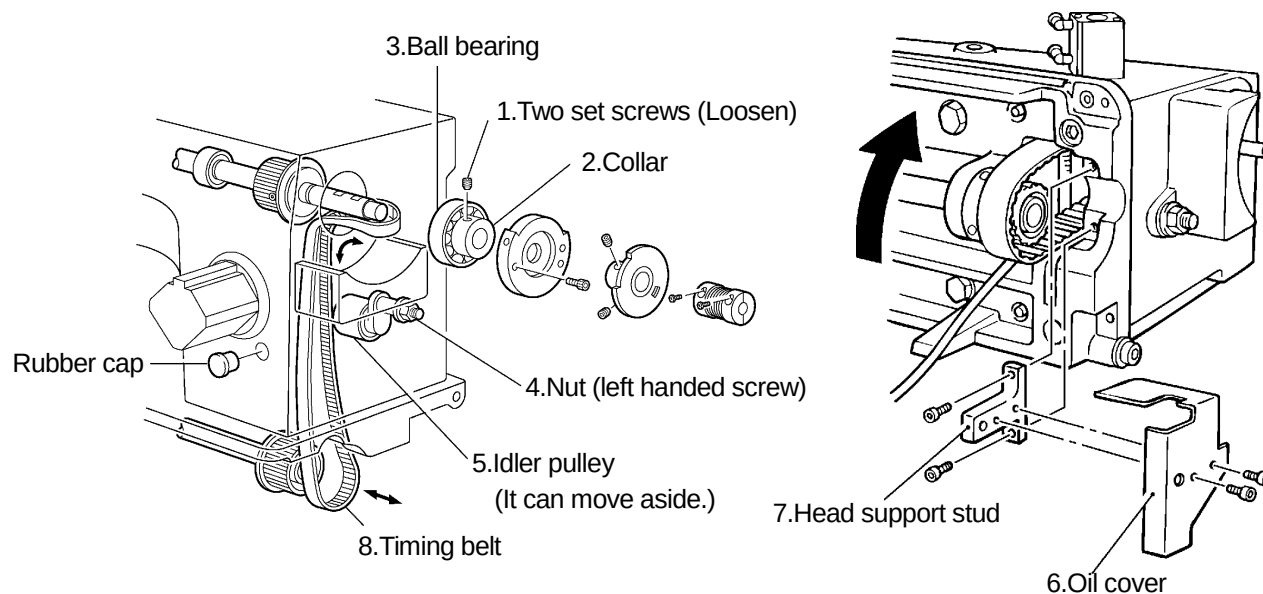
3-6. Motor



1668S

- * Mark installing position of the two sensors, before loosen these screws.
- ** Mark so that distinction of a sensor may stick, before remove these sensors.

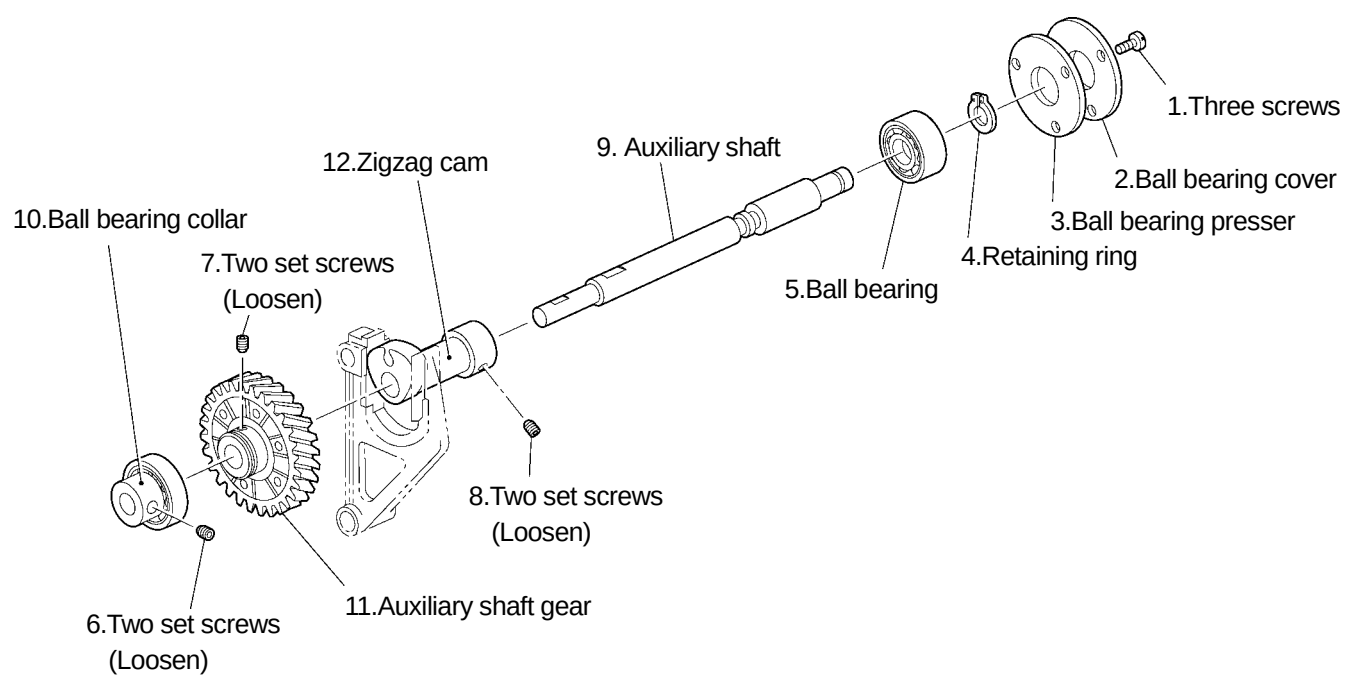
3-7. Timing belt



1416S

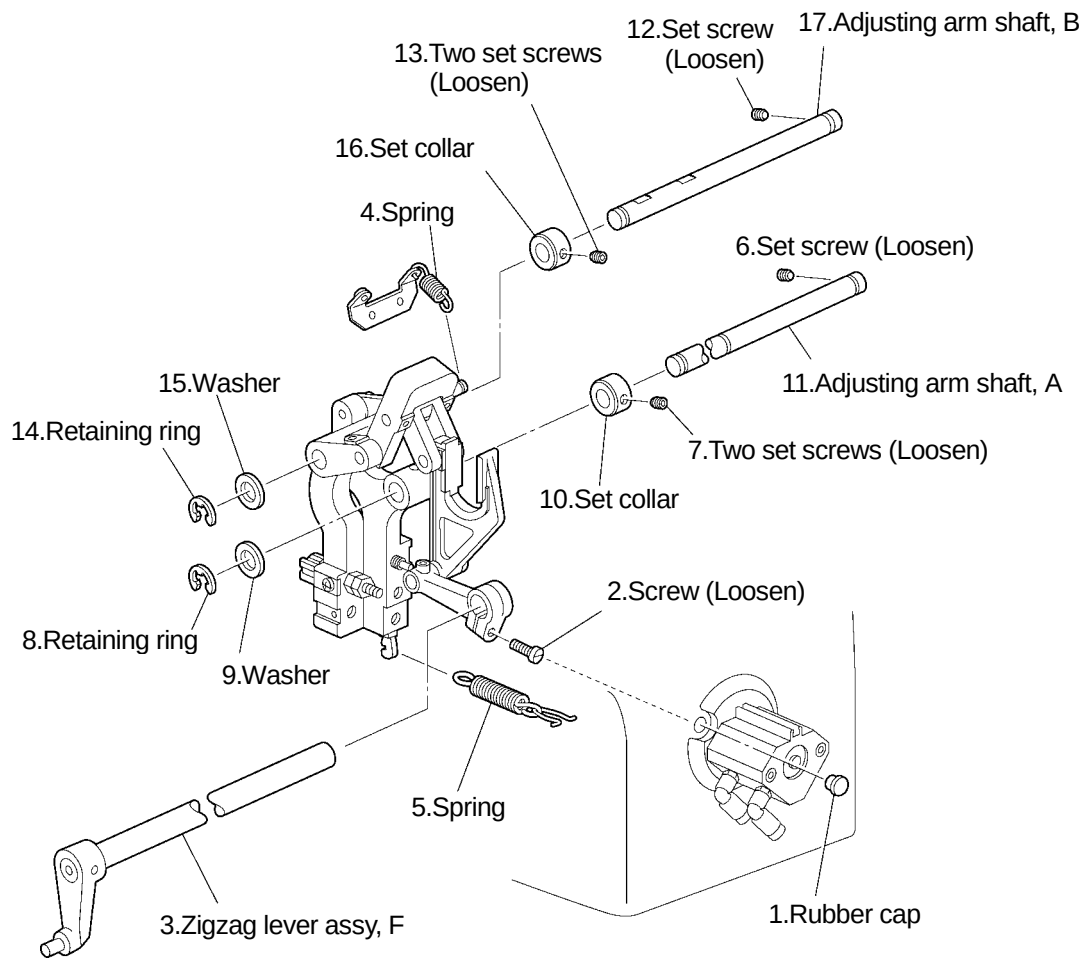
1414S

3-8. Auxiliary shaft



1669S

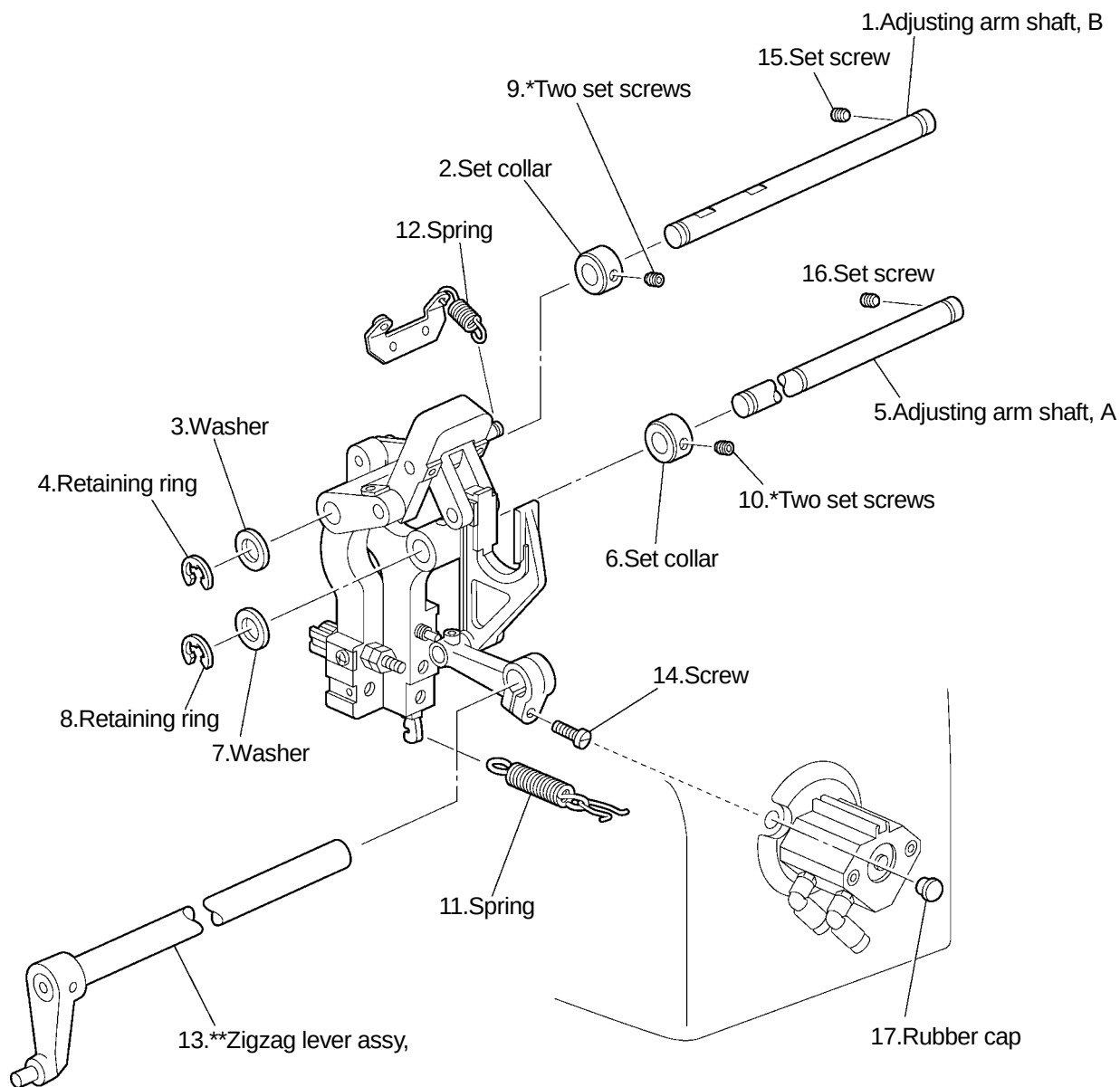
3-9. Zigzag



1670S

4. ASSEMBLY

4-1. Zigzag

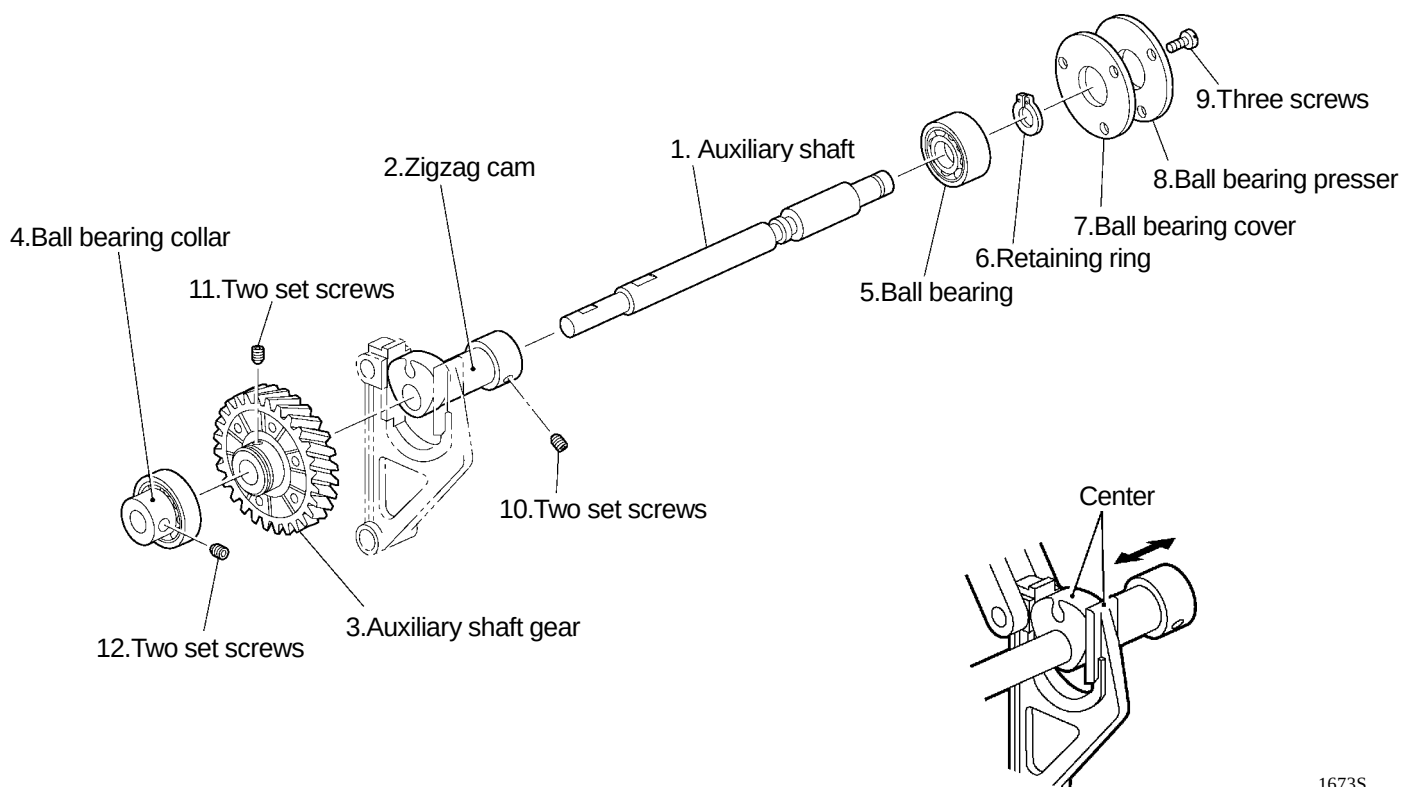


* Tighten the arm fasteners in a washer and a set collar so that there is no longitudinal play in the arm.

** Adjust on "5-1. Adjusting the zigzag movement".

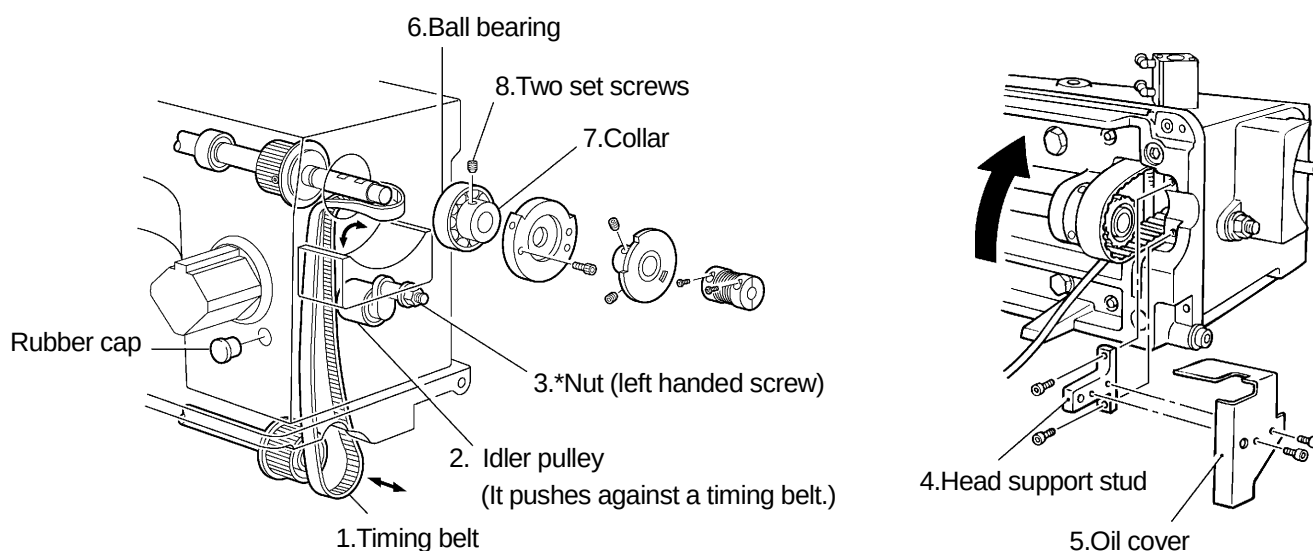
4-2. Auxiliary shaft

1669S



1673S

4-3. Timing belt



1416S

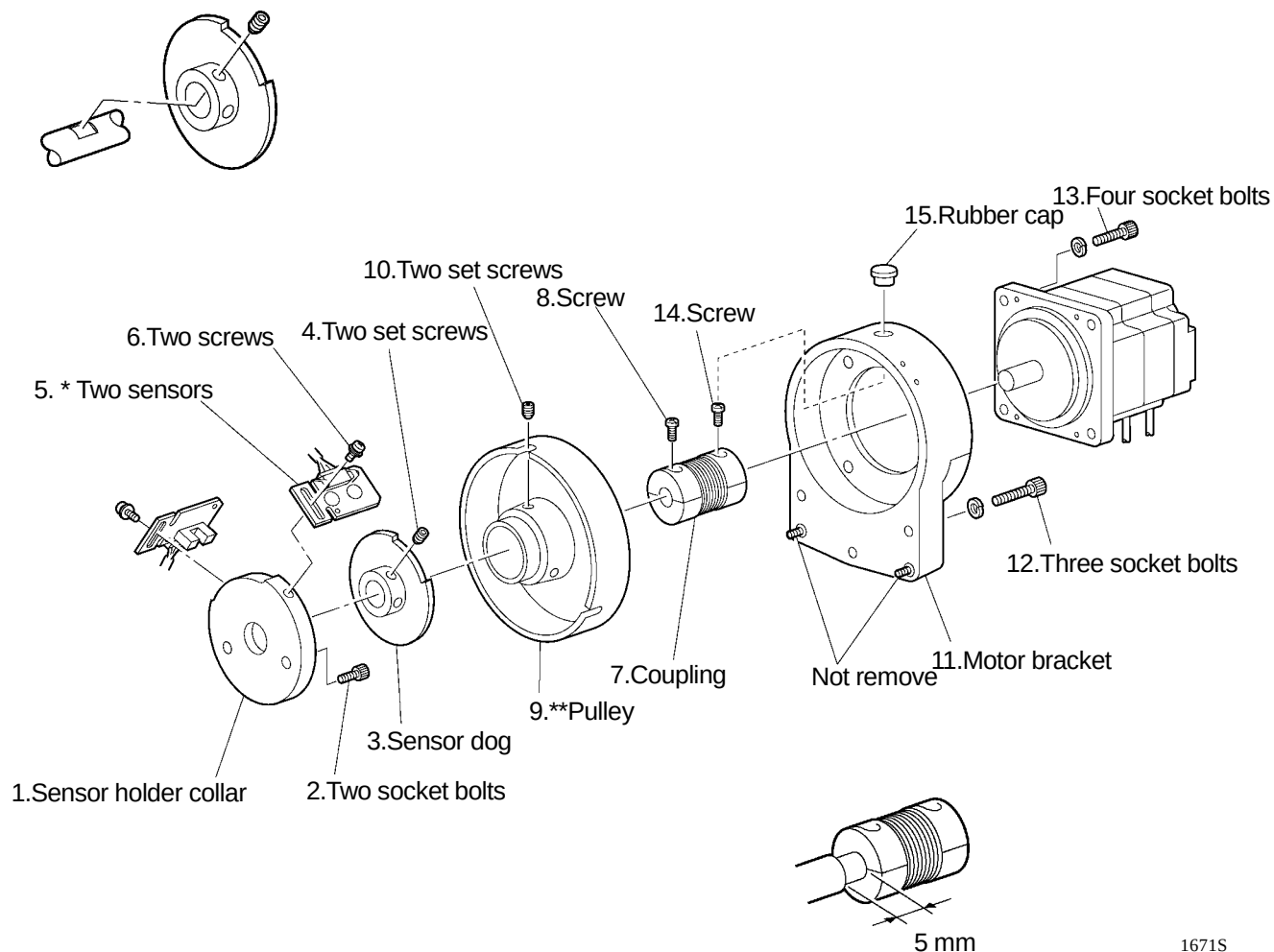
1414S

* Remove the rubber cap on the front of the arm. Adjust the timing belt tension so that the belt deflects 7 mm when it is pressed with a force of 9.8 N. Tighten the nut (3) (left hand screw).

4-4. Motor

1672S

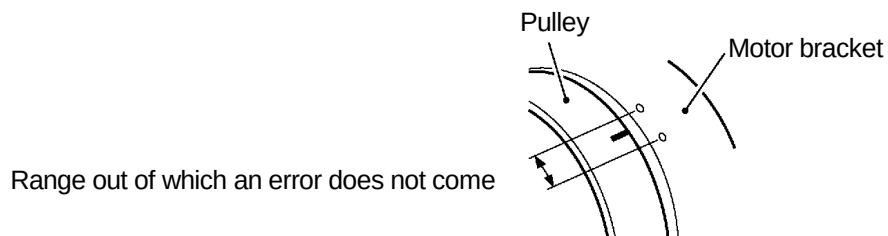
1668S



1671S

* Adjust on "5-6. Adjusting machine sensor".

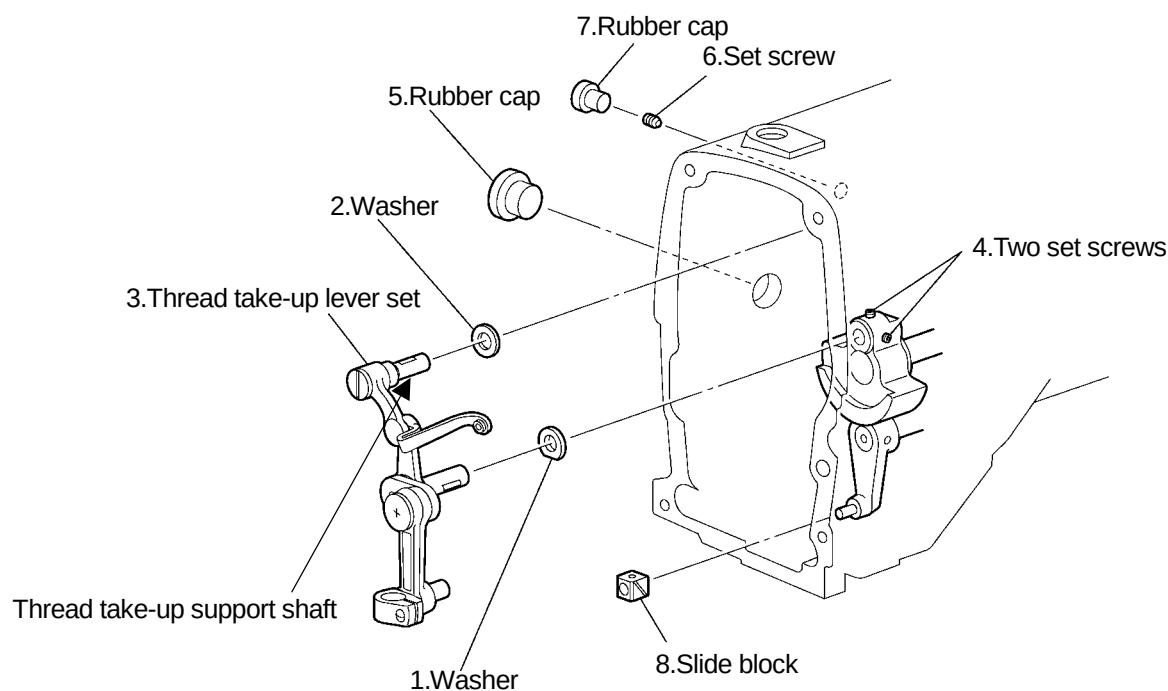
** When turn on the power, turn the pulley until the error mark U51 (needle lowered) disappears. Then, fix the pulley using the screw (10) so that the index mark of the pulley is between the two index marks of the motor bracket (11).



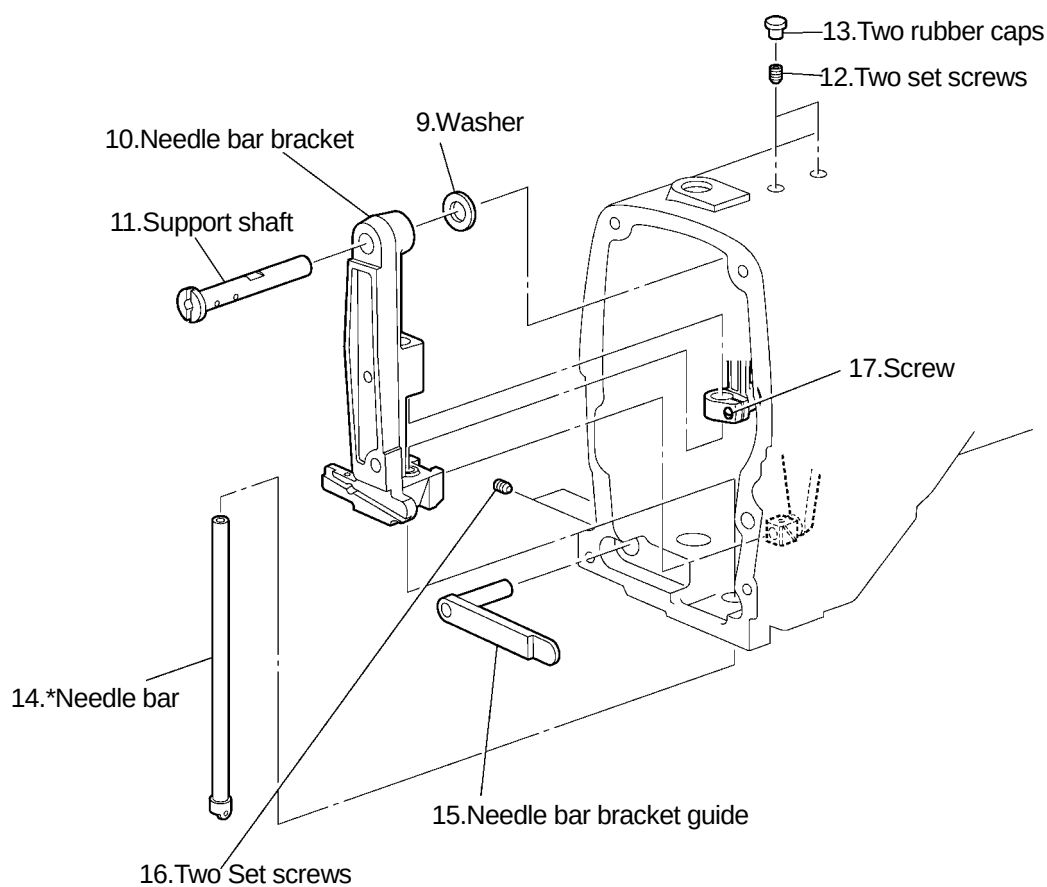
1852S

4-5. Needle bar

1667S



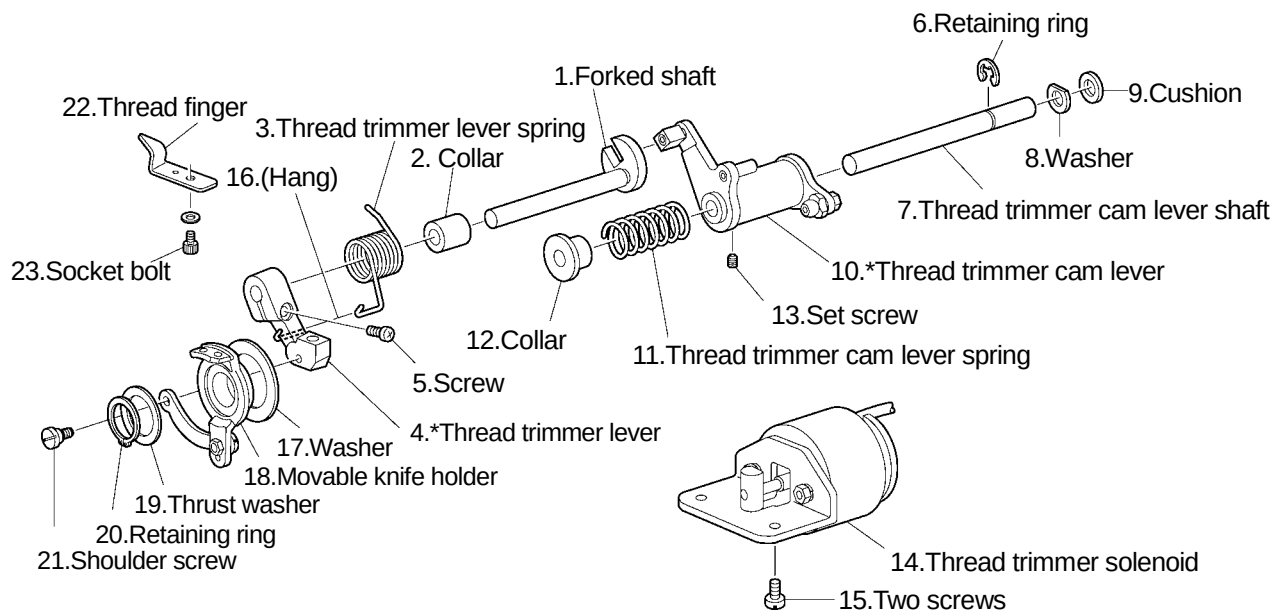
* Thread take-up support shaft is noticed about oil supply and attachment.
It may burn and adhere depending on the case.



1666S

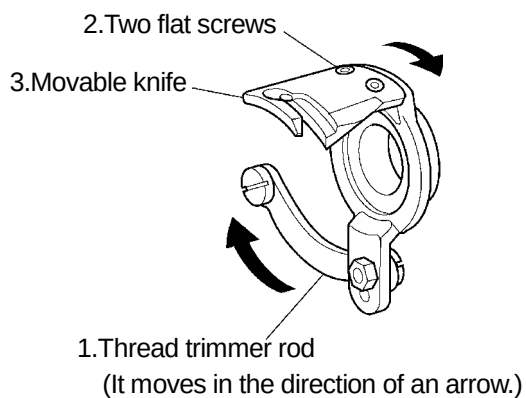
* Adjust on "5-2. Adjusting the needle bar height and, the needle and the rotary hook timing".

4-6. Movable knife and thread trimmer

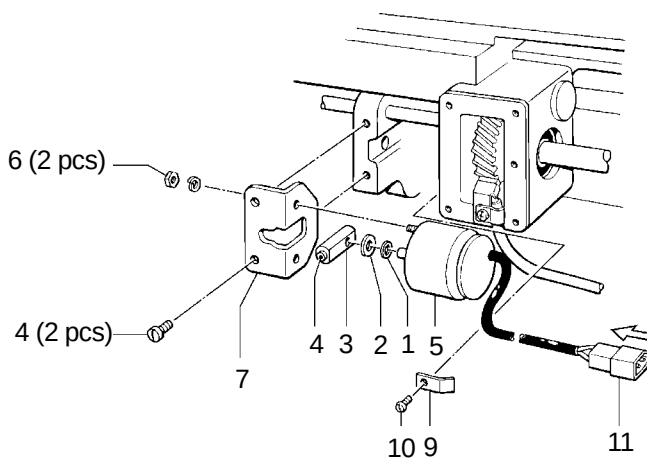


* Adjust on "5-3. Adjusting the thread trimmer timing".

1665S



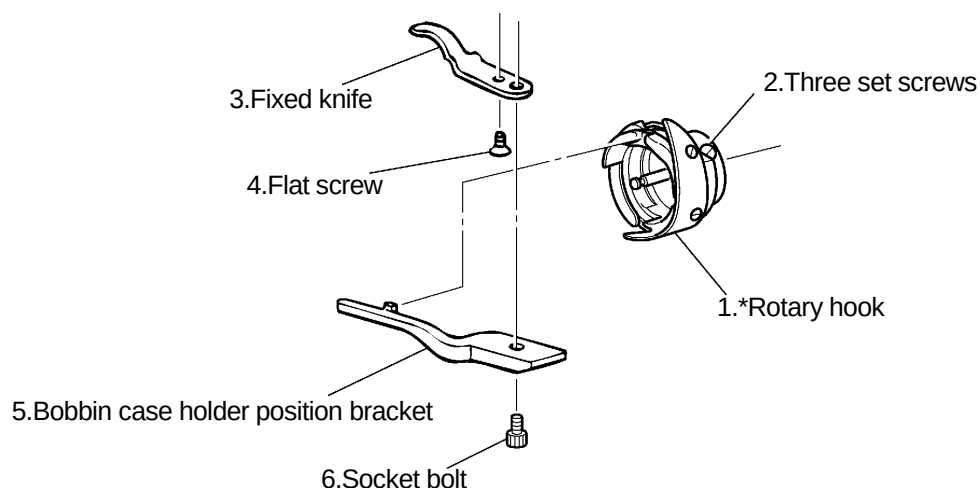
1664S



1412S

<Installing thread trimmer solenoid>

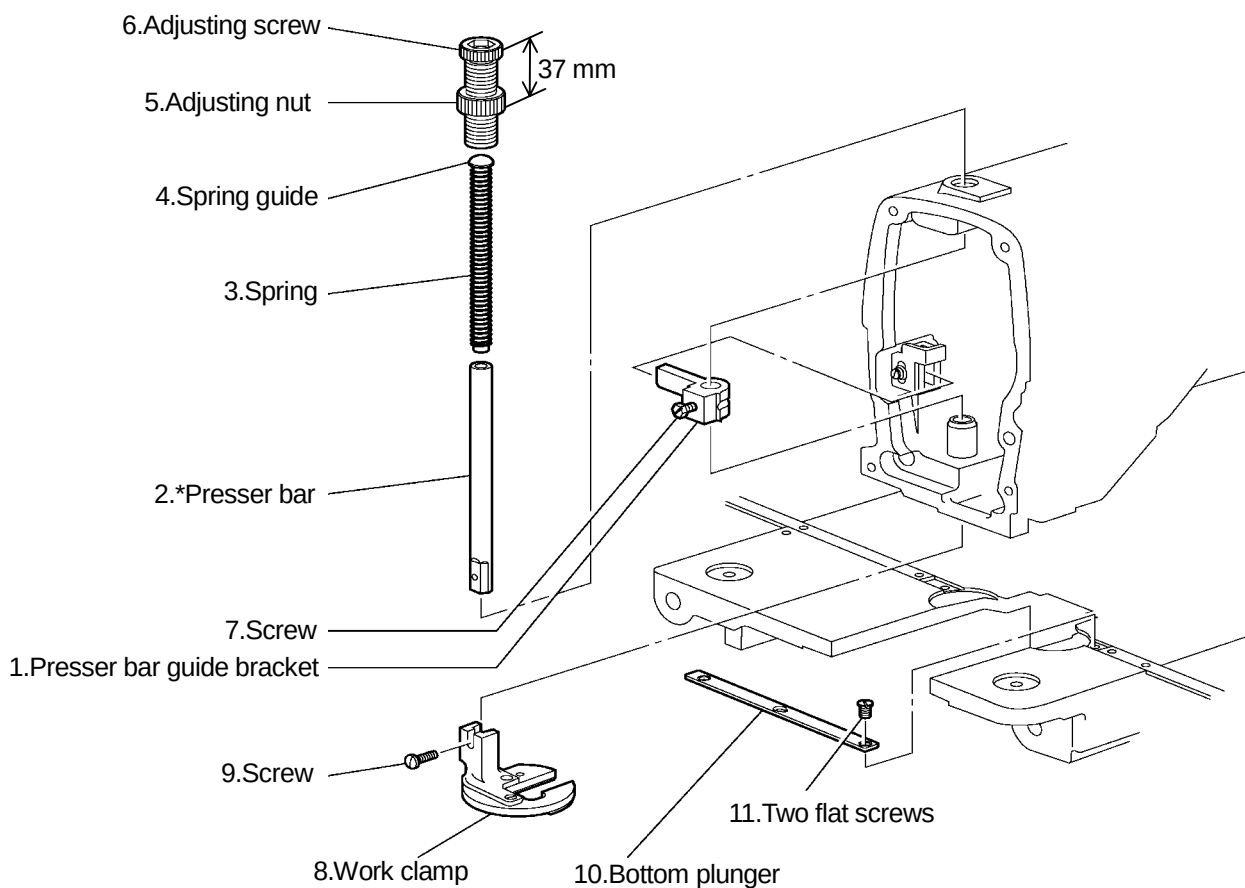
4-7. Rotary hook and fixed knife



1663S

* Adjust on "5-2. Adjusting the needle bar height and, the needle and the rotary hook timing".

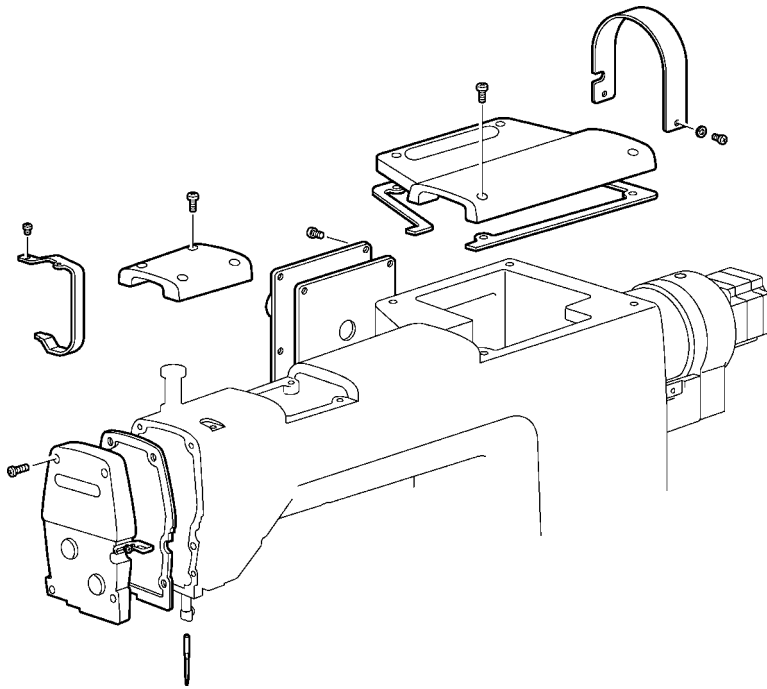
4-8. Presser foot mechanism



1662S

* Adjust on "5-7. Adjusting the presser foot height".

4-9. Cover



1661S

5. ADJUSTMENT

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION



Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.



Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.



Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife.



Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to "0" before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.



If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this could cause the machine head to topple over, which may result in personal injury or damage to the machine.



Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.

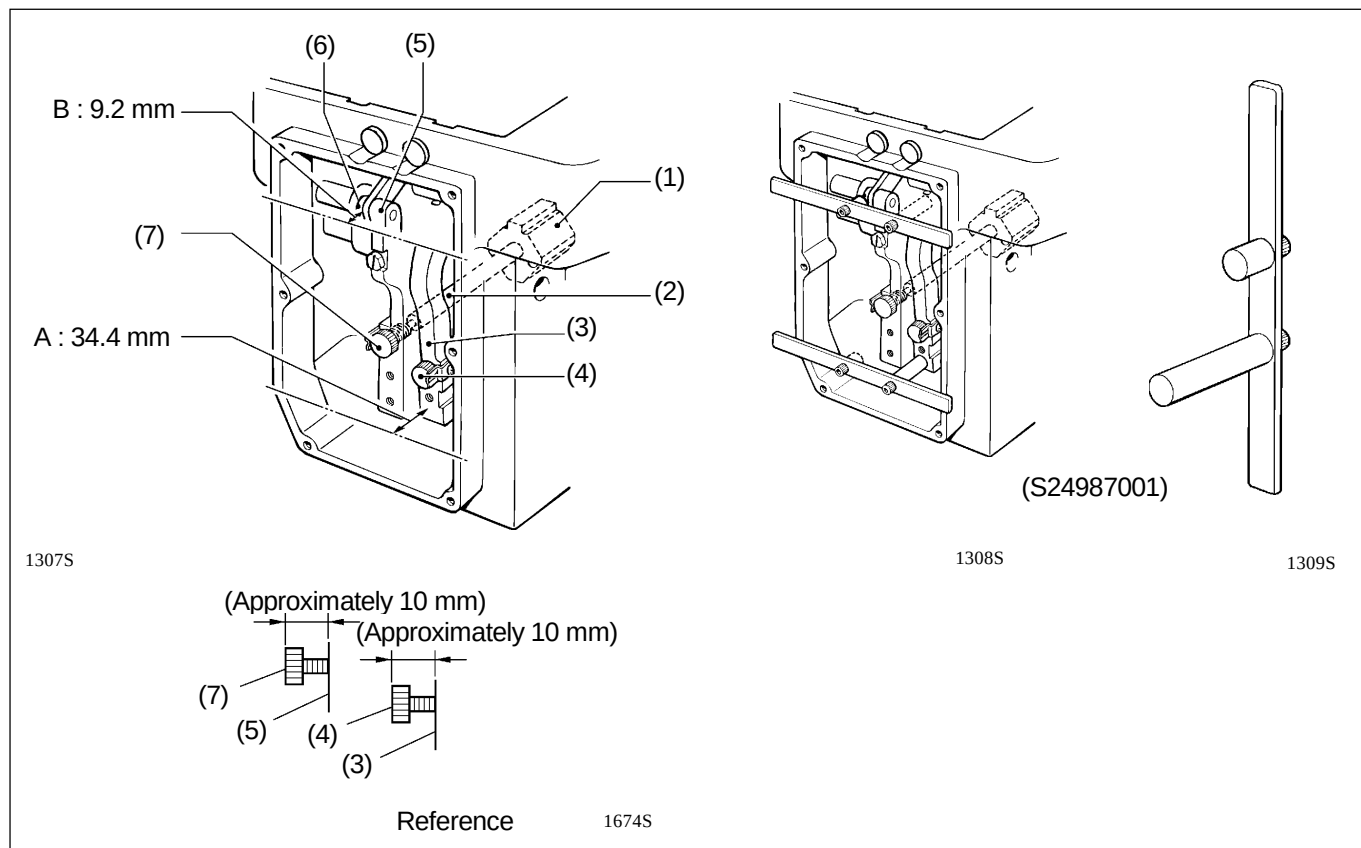


If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

If the power switch is turned on, take sufficient safety measures, such as to make E-800 (emergency stop) come on in the manual mode.

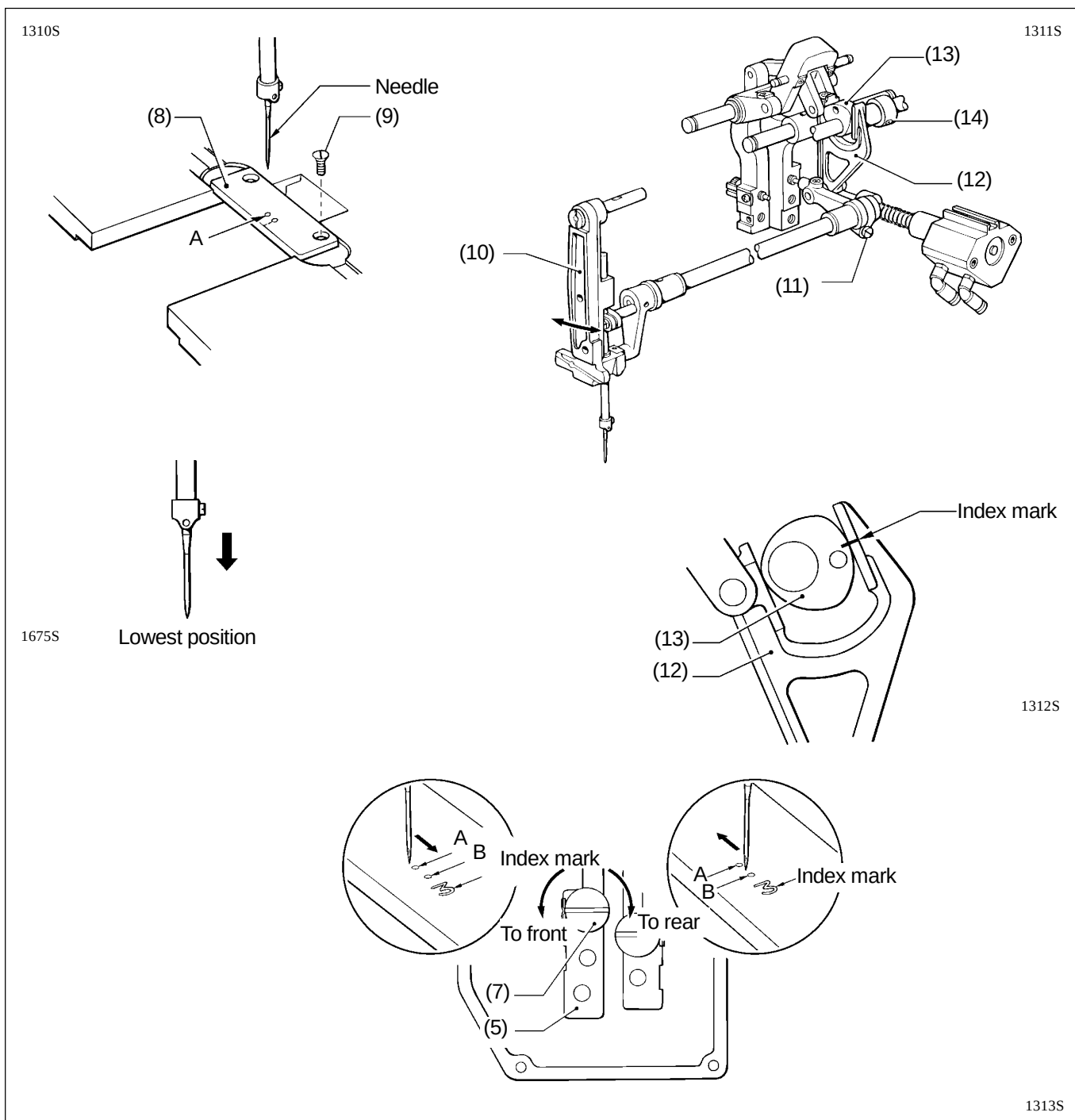
5-1. Adjusting the zigzag movement

Remove the top cover, the rear cover, the slide plate (the needle plate), the bottom plunger and the work clamp while making this adjustment.

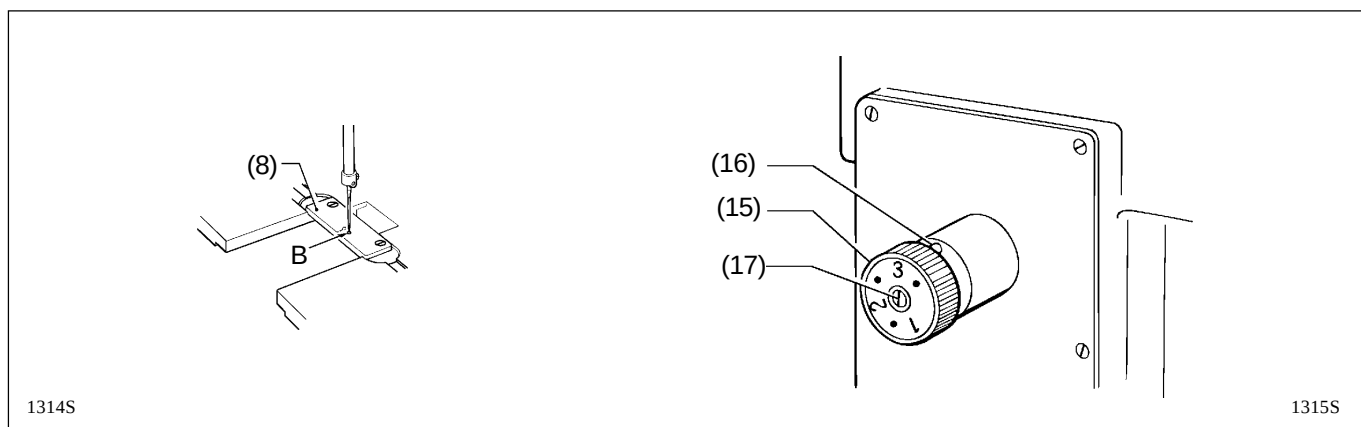


1. When the air pressure is applied and the zigzag connecting shaft (2) is pushed out by the zigzag cylinder (1). (No zigzag movement)
 2. Dimension A : The surface where the rear cover will be attached --- The surface of the adjust arm (3) / Adjust by → The bar tacking adjust screw (4)
 3. Dimension B : The surface where the rear cover will be attached --- The circumference of the stud screw (6) for the zigzag adjust arm (5) / Adjust by → The zigzag adjust screw (7)
- * Optional gauge : The zigzag gauge plate assembly (Code S24987001)

5. ADJUSTMENT



4. Attach the zigzag gauge (8) (accessory) to the bed. Using the two flat screws.
5. Attach a needle. (thin needle equivalent to #9-11)
6. The needle is aligned with needle hole A of the zigzag gauge (8). Adjust → Loosen the screw (11), move the needle bar bracket (10) in the direction of the arrow
7. The needle : Lowest position → Turn the pulley
Align the index marks of the zigzag adjust fork (12) and the zigzag cam (13). Adjust → Loosen the two screws (14)
8. The needle does not move sideways. Adjust → Turn the zigzag adjust screw (7) for the zigzag adjust arm (5)
If the needle moves to the front (toward the carved mark), turn the zigzag adjust screw (7) clockwise. (when seen from the end)
If the needle moves toward the rear, turn the zigzag adjust screw (7) counterclockwise. (when seen from the end)



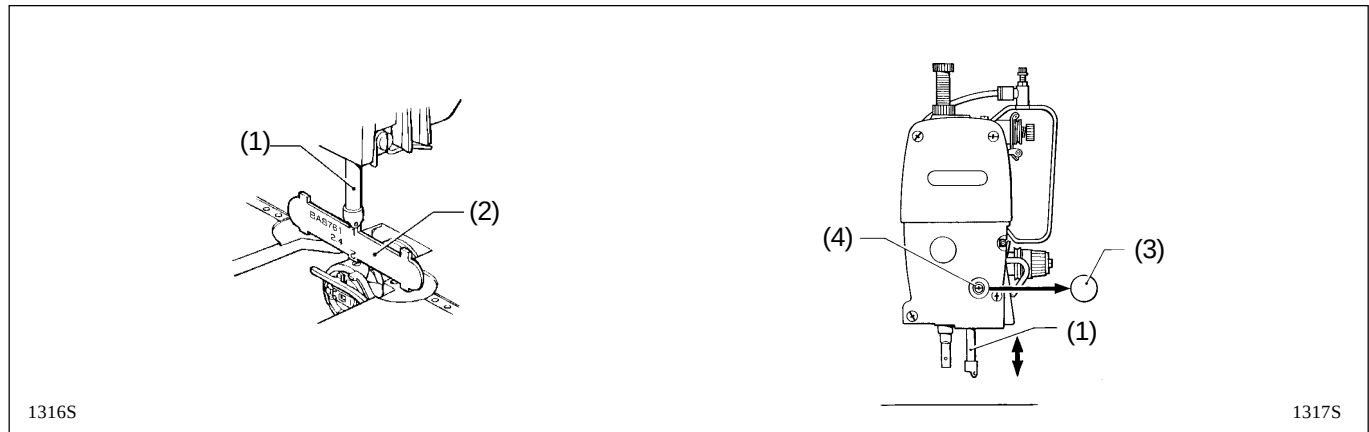
9. The zigzag cylinder (1) pulls in the zigzag connecting shaft (2). (Zigzag ON)
10. Install the rear cover.
11. Turn the pulley to lower the needle bar. Needle hole B of the zigzag gauge (8) is aligned with the needle. Adjust → Turn the zigzag dial (15)
12. When needle hole B is aligned with the needle, align the positioning pin (16) with scale "3" of the zigzag dial (15). Adjust → Loosen the screw (17).
- * At the time of shipment, the scale position may have shifted for a while. (It is because sewing finish was adjusted.)
13. Remove the zigzag gauge (8). Attach the needle to be used.
14. Set the zigzag dial (15) to the maximum, and make sure that the needle does not strike the fixed knife during zigzag sewing.
15. There is no reciprocating movement.

5. ADJUSTMENT

5-2. Adjusting the needle bar height and, the needle and the rotary hook timing

Remove the slide plate (the needle plate), the bottom plunger and the work clamp while making this adjustment.

<Adjusting the needle bar height>



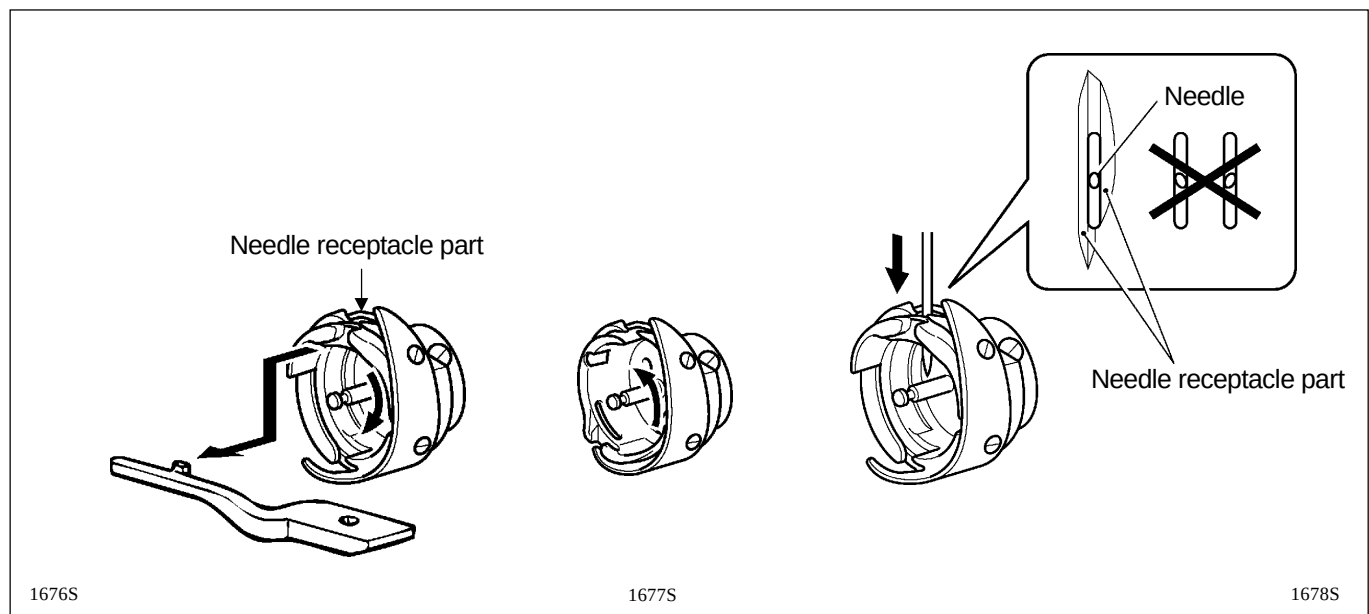
Turn the pulley to set the needle bar (1) to its lowest position. Put the side “1” of the gauge (2) at the end edge of the needle bar (1). Adjust → Remove the rubber cap (3), Loose the screw (4)

<Adjusting the rotary hook>

This adjustment is performed in order to prevent the damage to inner rotary hook with a needle. (The rotary hook life is influenced.)

Perform this adjustment, when needle is exchanged. (Since special rotary hook is used, be sure to use the exclusive needle.)

Remove the bobbin case holder position bracket while making this adjustment.



Inner rotary hook is rotated so that the needle receptacle part may turn down.

<Timing of the needle and the rotary hook> of the following clause is performed.

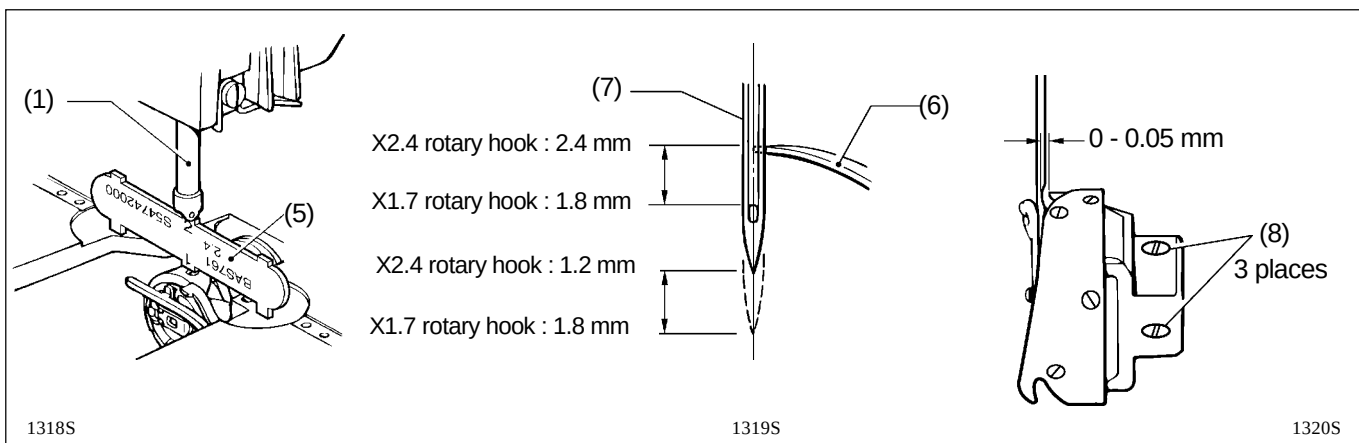
The needle receptacle part is returned upwards.

Turn the machine pulley to move the needle bar its lowest position.

It checks that the needle has not hit the needle receptacle part.

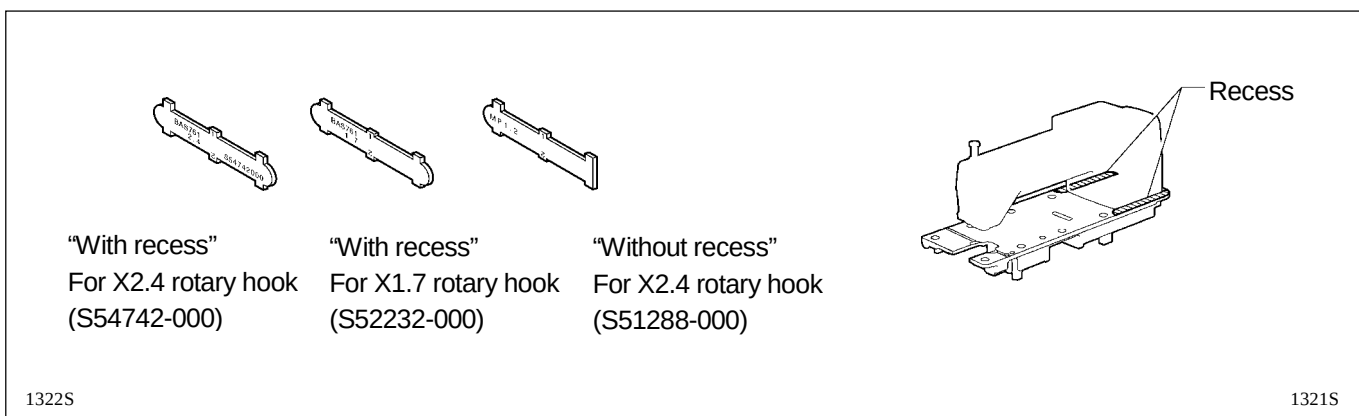
When hitting, it reattaches so that the needle may meet the needle receptacle.

<Adjusting the needle and the rotary hook timing>



Turn the pulley to raise the needle bar (1) from its lowest position. Adjust the rotary hook so that the side "2" of the gauge (5) and the lower end of the needle bar (1) align. At this time, the clearance between the needle and the rotary hook point should be 0 to 0.05 mm. Adjust → Loosen the two screws (8)

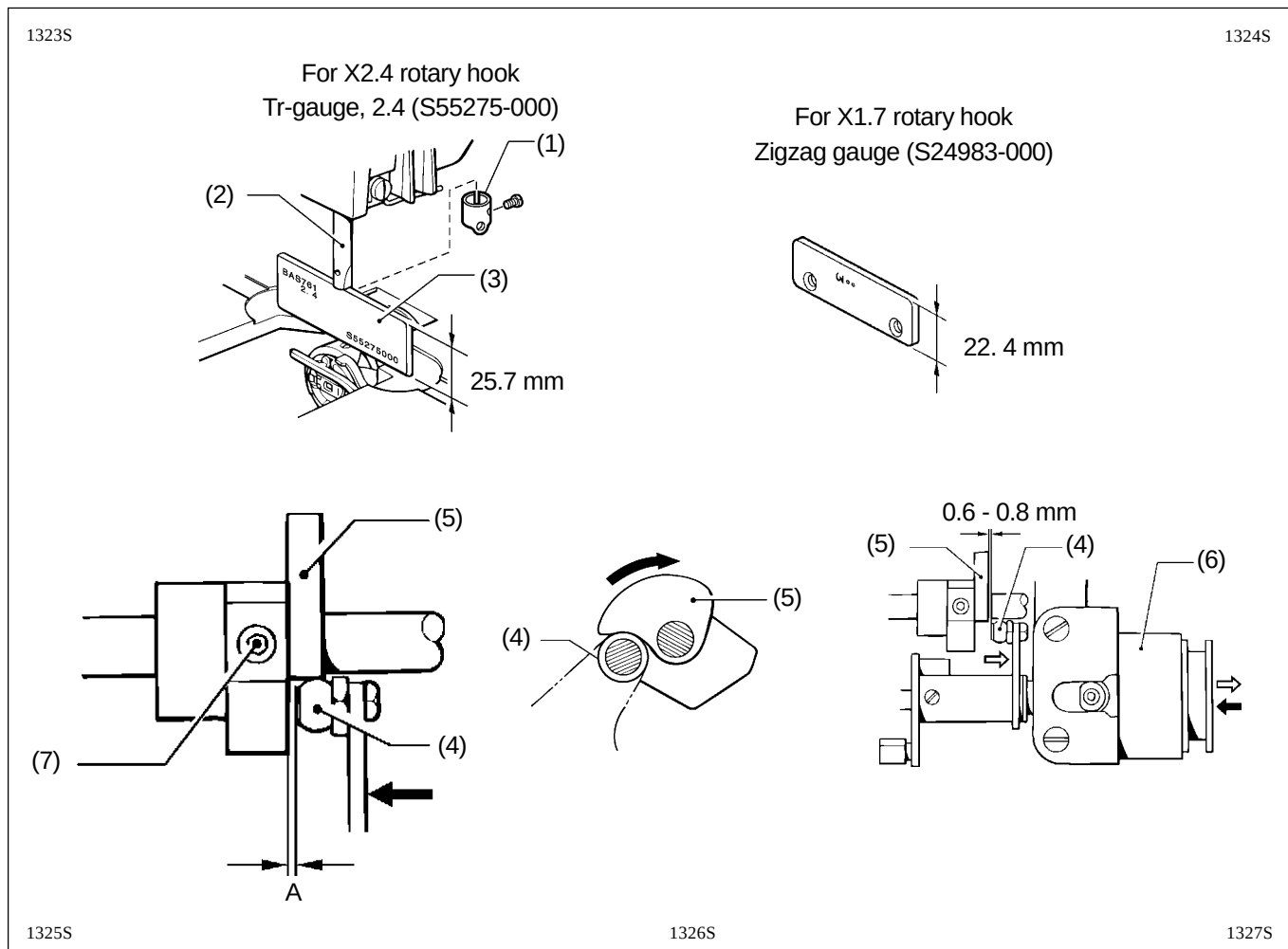
* If there is a recess at the right edge of the bed, use gauge "With recess" ; if there is none, use gauge "Without recess".



5-3. Adjusting the thread trimmer timing

Remove the slide plate (the needle plate), the bottom plunger and the work clamp while making this adjustment.

<Adjusting the thread trimmer cam position>

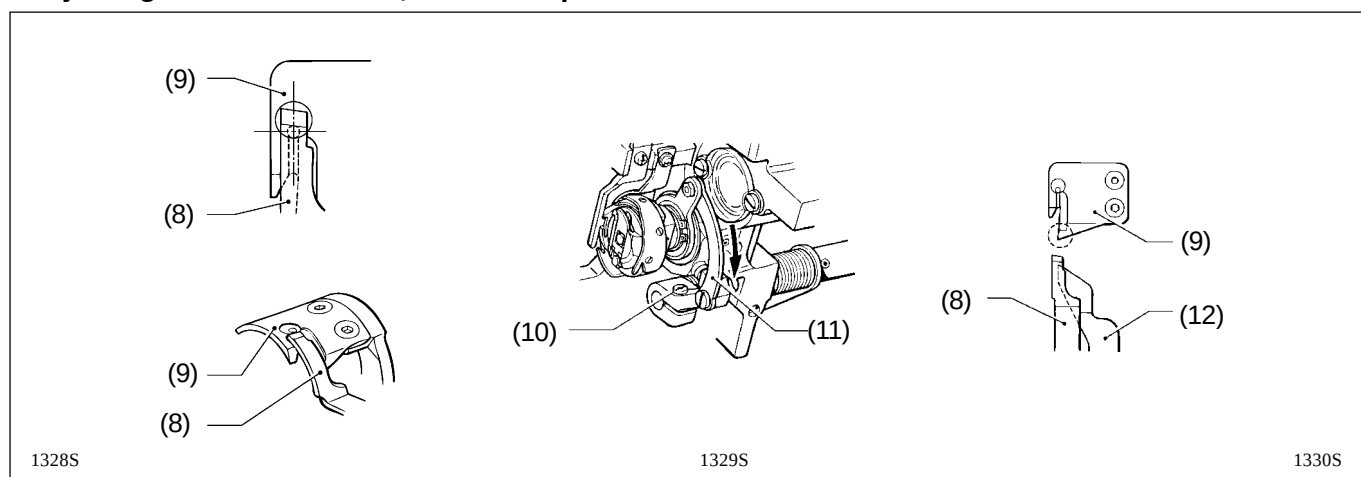


1. Remove the thread guide of the needle bar (1).
2. Turn the machine pulley until the needle bar (2) is raised A mm above its lowest position. (A mm : X2.4 rotary hook → 8.0 mm, X1.7 rotary hook → 7.1 mm) The end of the zigzag gauge (3) should align with the bottom of the needle bar (2). At this time, press the thread trimmer solenoid (6) by hand so that the roller shaft contacts the concave portion of the thread trimmer cam (5), and then temporarily tighten the screw (7).
3. When the thread trimmer solenoid (6) is returned to its original position (released), adjust the thread trimmer cam (5) by loosening the screw (7) so that the spacing between the thread trimmer cam (5) and the roller shaft is 0.6 - 0.8 mm. (Tighten the screw (7) to approximately 4 Nm.)

After adjustment, check the gap A = 0.5 mm in the illustration.

Reference

Timing of the thread trimmer cam to the thread take-up (needle bar height)	
Delay	Thread trailing amount becomes long.
Early	Thread trailing amount becomes short.

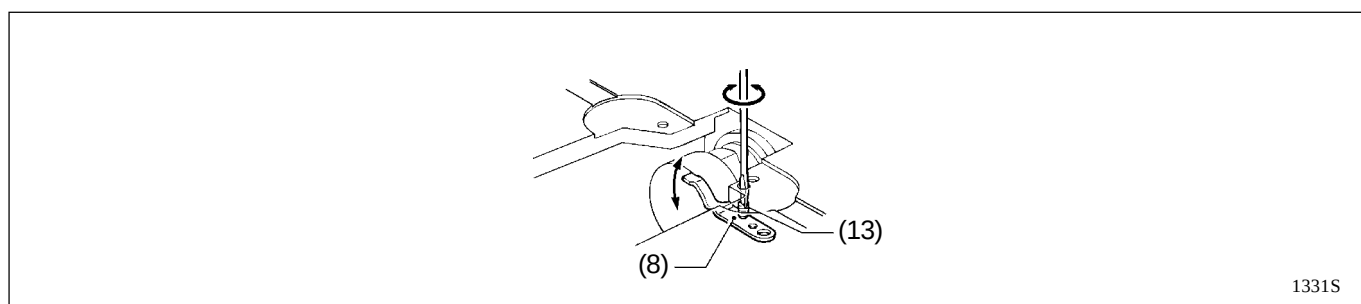
<Adjusting the movable knife, fixed knife position>

4. The fixed knife (8) and the movable knife (9) must overlap when the slide block of the thread trimmer cam (5) is lifted to the top of the roller (4) the thread trimmer cam lever. To increase the overlap, loosen the screw (10) to move the thread trimmer lever (11) in the direction of the arrow.

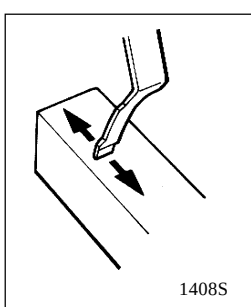
* Set the lower thread finger (12) under the movable knife (9).

<Adjusting the fixed knife pressure>

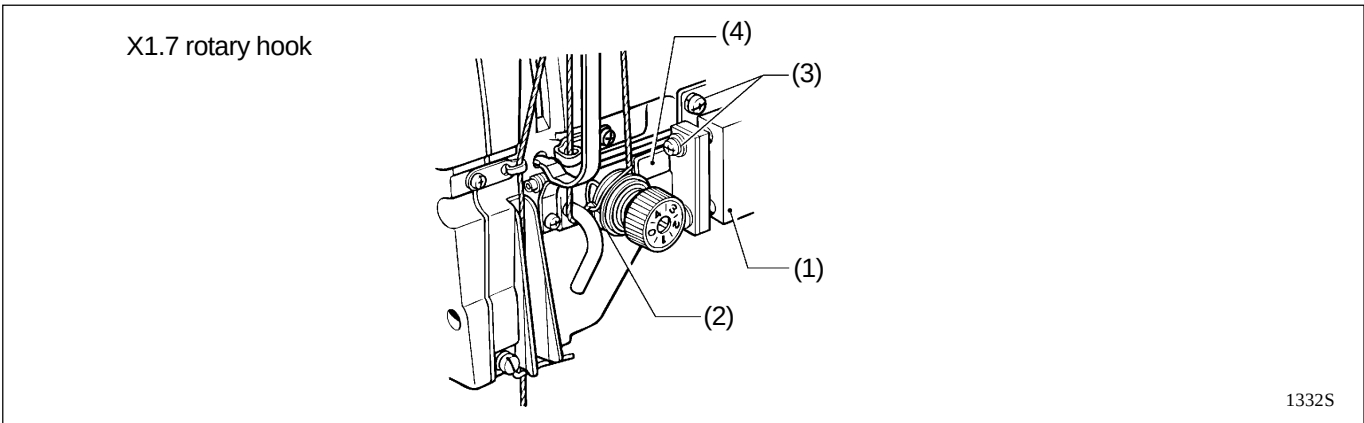
If the fixed knife (8) pressure is not adjusted properly, the knife will not trim the thread completely.



5. Adjust → Turn the screw (13)

<The method of sharpening the fixed knife>

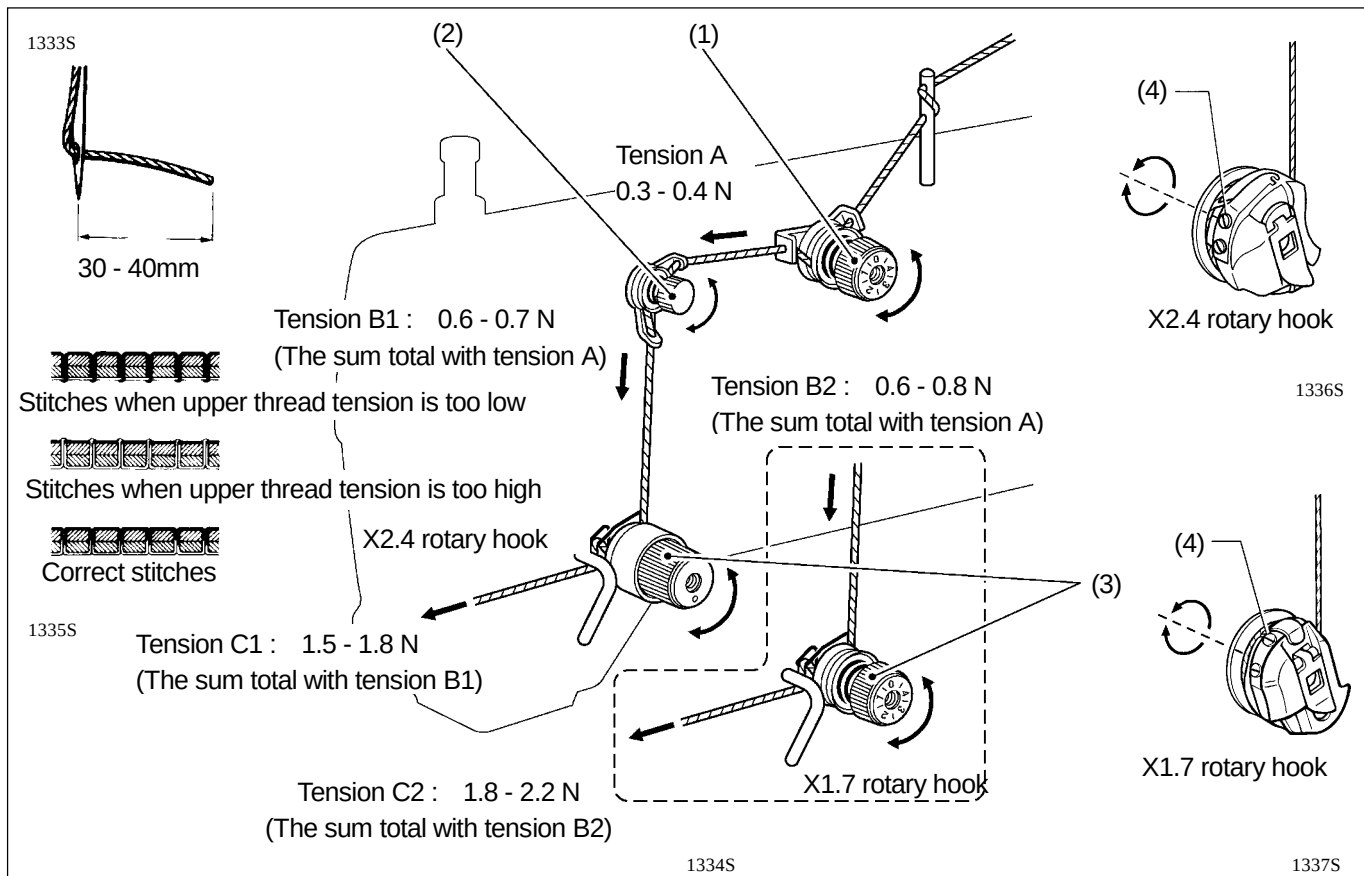
5-4. Tension release



Make sure that the tension disks (2) are open and there is no resistance in the needle thread when the cylinder (1) operates (after the presser foot is raised by pressing the presser foot switch on the operation panel).

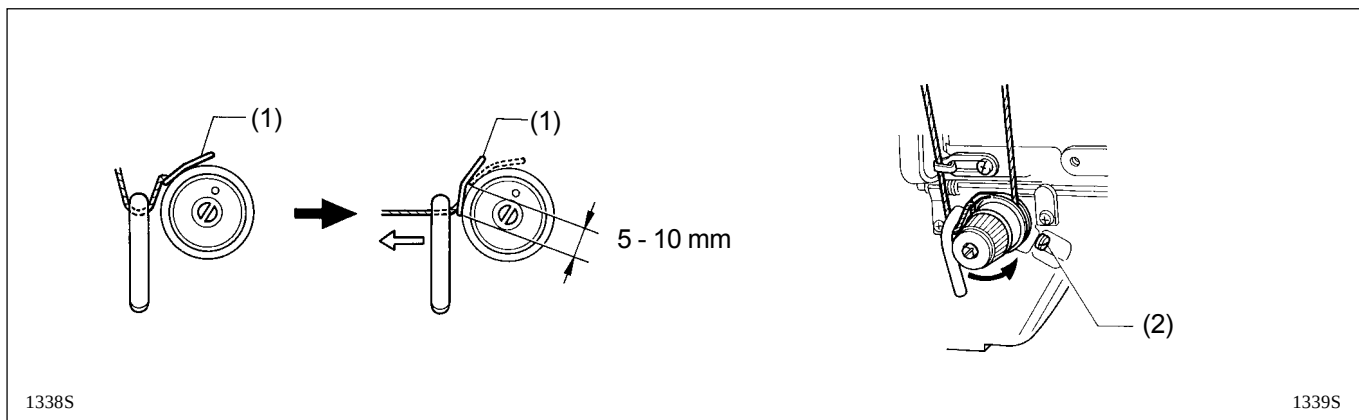
1. Adjust → Loosen the four screws (3), the position of the claw (4)
2. Make sure that the tension disks (2) are close and there is resistance in the needle thread when the cylinder (1) returns.

5-5. Thread tension

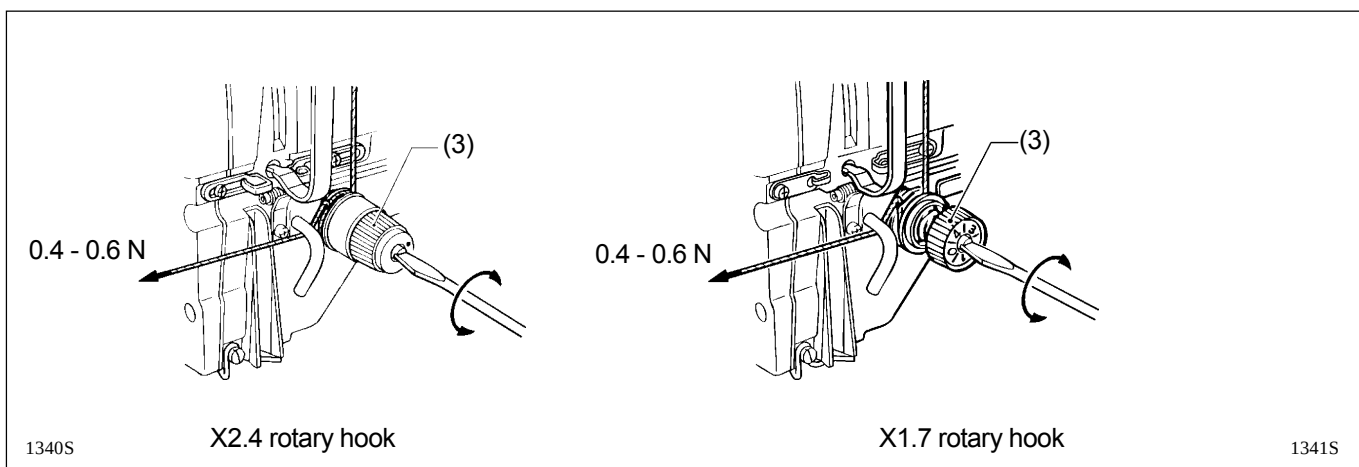


1. When the thread take-up lever is in the highest position after thread trimming, thread length is 30 - 40 mm. Adjust → Turn the tension screw (2) The tension B are in the illustration.
 2. Lower the presser foot. The tension A, C are in illustration. Adjust → Turn the tension control dials (1), (3)
 3. Lower thread tension to 0.4 - 0.6 N Adjust → Turn the tension regulating screw (4)
- * As a result of performing the above-mentioned adjustment, when the amount of thread remainder does not become proper, check " 5-3. Adjusting the thread trimmer timing "
- * The sewing conditions given in the thread tension may need to be changed depending on the article being sewn.

<Thread take - up spring>



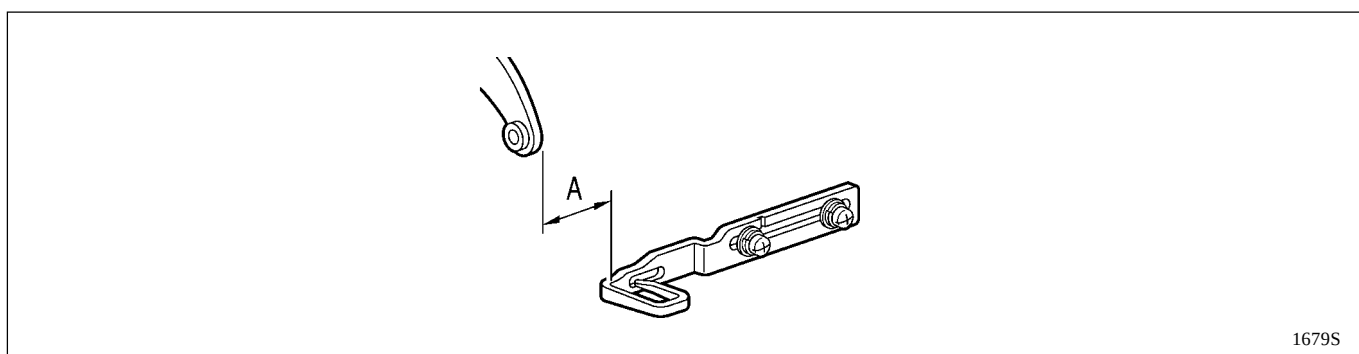
1. Stroke : Adjust → Loosen set-screw (2), Turn the whole unit of the tension regulator assembly



2. Force : Adjust → Insert a screwdriver tip into the groove of tension stud (3), Turn the tension stud
(The tension in the thread take-up spring when it is pulling the upper thread straight to the side at the point where the spring starts to move.)

<Thread guide, R>

In the case of " X2.4 rotary hook " specification, the thread guide, R can also adjust thread tightening. (It is because the width of adjustment of a position is large.)



It will be good tightening if a size A is enlarged.

If a size A is enlarged when using inelastic thread, thread may break.

Reference

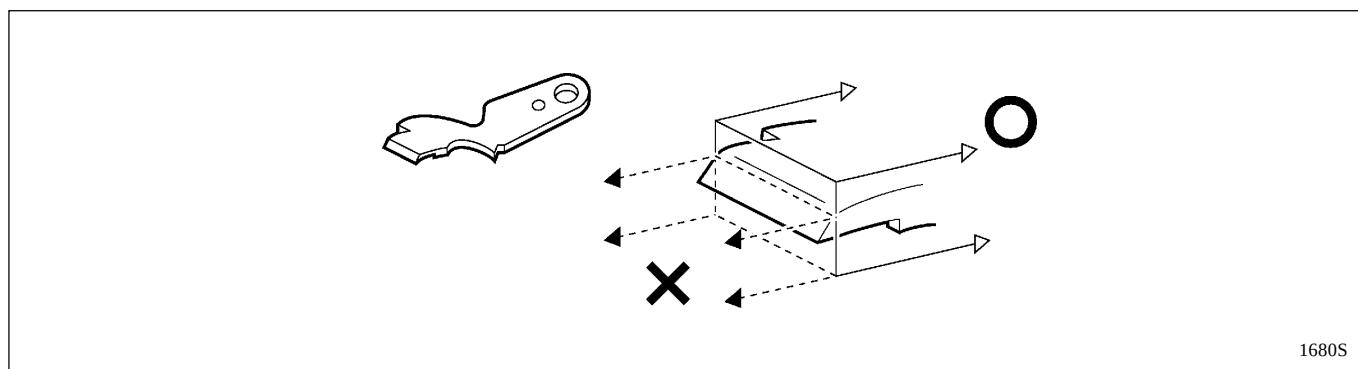
T - 105 (twisted) thread : Size A → 12 - 19 mm

Inelastic thread : Size A → 10 mm or less

5. ADJUSTMENT

<Fixed knife>

The surface state of the fixed knife may influence tightening of thread.



1680S

When polishing the fixed knife, only the portion shown in the figure is polished.

Note

Do not polish the edge of the fixed knife by any means.

The edge of the fixed knife is ground with reference to <The method of sharpening the fixed knife> of “5-3. Adjusting the thread trimmer timing”.

<Needle>

Since special rotary hook is used, be sure to use the exclusive needle.

	Rotary hook	Needle
For X2.4 rotary hook	S45663ROTARY HOOK ASSY, 2.4 W/BOX (SA1624301)	NEEDLE, SERV7-NiT (S51810022)
For X1.7 rotary hook	Inner rotary hook chromium coat type S24903ROTARY HOOK ASSY, 1.7 W/BOX (SA1625201)	NEEDLE, 1955-01 MR5 (S24705005)
	Inner rotary hook titanium coat type S40854ROTARY HOOK ASSY, 1.7 W/BOX (SA1626101)	
	Inner rotary hook chromium coat type S34823ROTARY HOOK ASSY, 1.7 W/BOX (SA1627101)	NEEDLE, 1955-01 MR4.5 (S24705045)

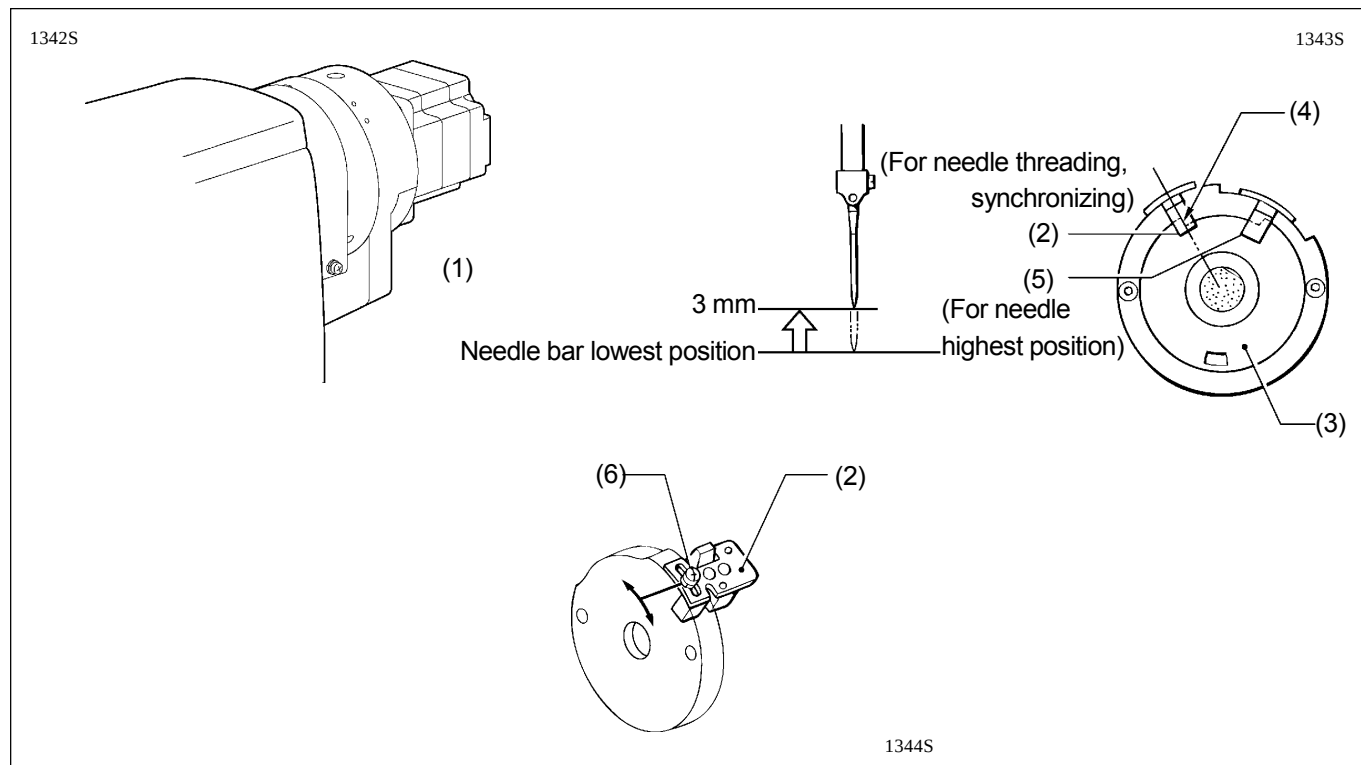
It is thinner than a recommendation needle. → It becomes easy to occur “skipped stitches” and “thread breakage”.

It is thicker than a recommendation needle. → Do not use it. If the needle touch the needle receptacle part of inner rotary hook in the needle bar lowest position, it becomes the cause by which the rotary hook life becomes short.

5-6. Adjusting the machine sensor

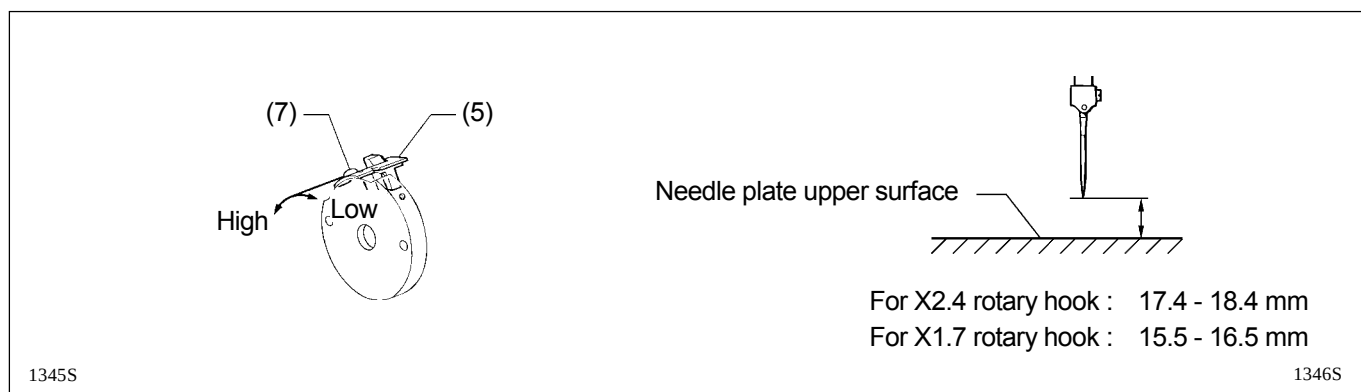
Both of the sensors -- adjustment width -- it becomes a central position mostly.
Remove the pulley cover (1) while making this adjustment.

<The sensor position to send the thread trimmer signal properly>



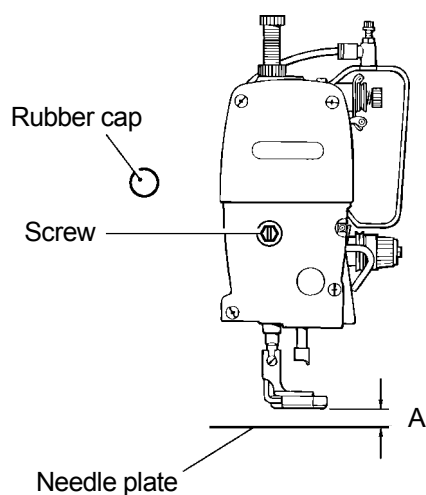
The needle rises 3 mm from its lowest position. At this time, the center of the machine sensor on the left (2) should be aligned with the slit (4) of the sensor dog (3). Adjust → Loosen the screw (6)

<The sensor position to send the up needle stop position signal properly>



When the needle is at its top position, it should stop in the illustration. Adjust → Loosen the screw (7)

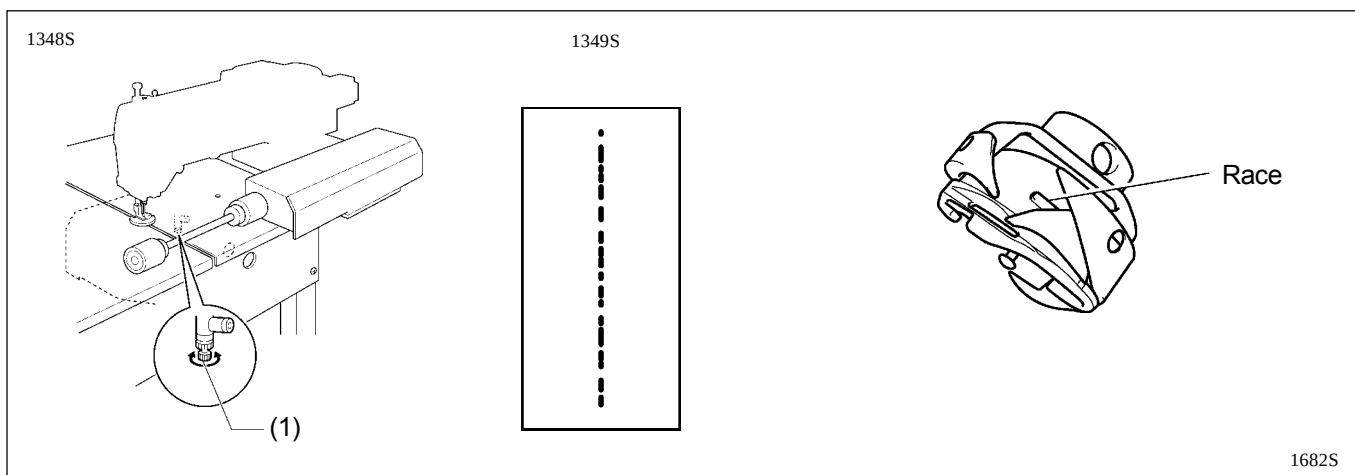
5-7. Adjusting the work clamp height



1681S

A	Work clamp down	Work clamp up
X2.4 rotary hook	3.5 mm	16.5 mm
X1.7 rotary hook	2 mm	14.5 mm

5-8. Adjusting the rotary hook lubrication amount



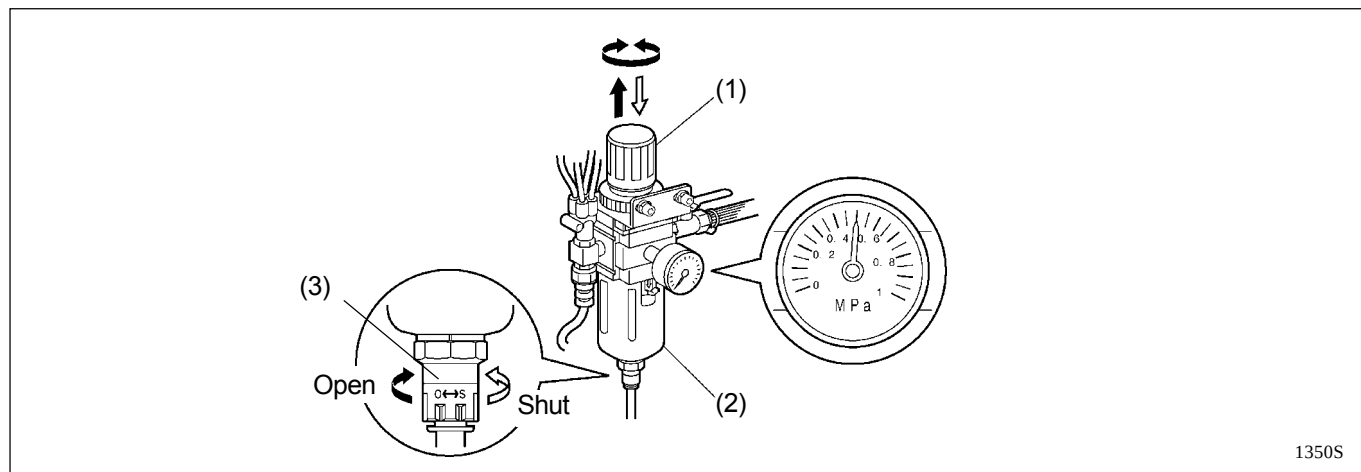
The amount of oil : In the illustration (Sewing speed 4250 rpm, 7 second) ---Factory setting

Adjust → Turn the screw (1)

1. Use machine head operation check : Mode change → Turn the power OFF, DIP switch A - 8 ON, Turn the power ON
2. Select sewing speed : 500 rpm – 9 steps - 4250 rpm Change → ΔV switch
3. Start → Start switch Stop → Emergency stop switch

* Oil checks having come out of the race part of rotary hook.

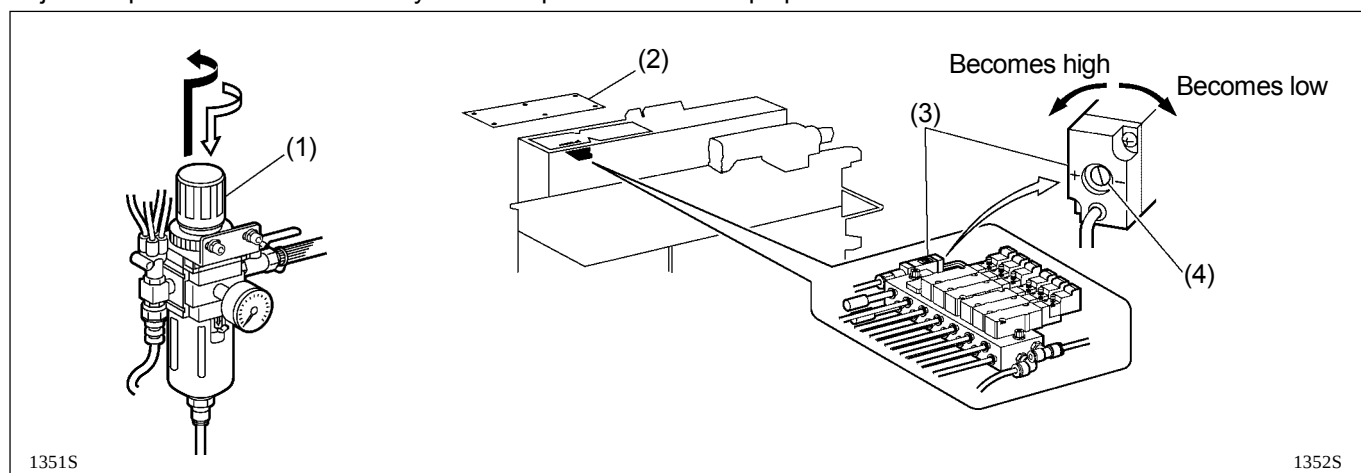
5-9. Adjusting the air pressure



1. Air pressure : 0.5 Mpa Adjust → Pull and turn the cap (1), After adjustment → Push the cap (1) down and lock it.
 2. When water is collected in the bottle (2), turn the cock (3) to drain water (direction O).
- * The water in a bottle will be automatically drained, if it collects to some extent.

5-10. Adjusting the pressure switch

Adjust the pressure switch accurately so as to operate with 0.34 Mpa pressure.

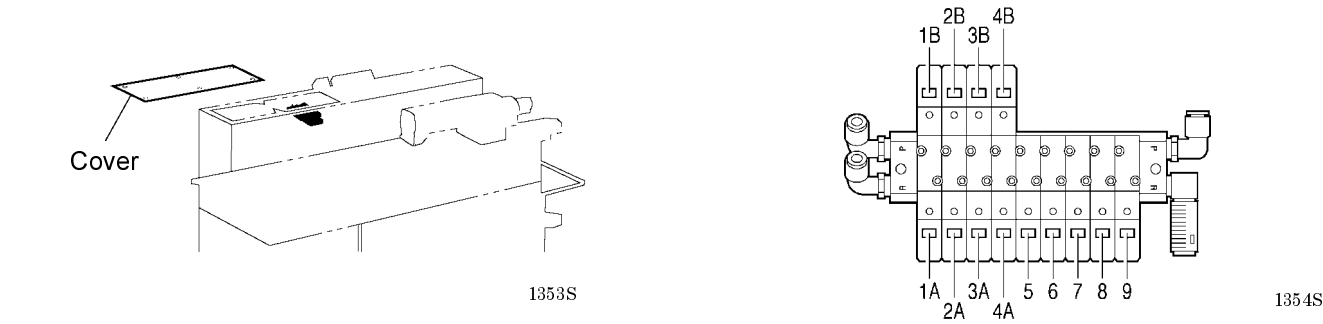


Remove the cover (2) while making this adjustment.

1. Air pressure (decrease) : 0.34 Mpa
 2. If error display on the control panel indicates E820, turn the screw (4) on the pressure switch (3) to decrease setup pressure to 0.98 - 2.0 Mpa for cancellation of the error display ; and then turn the screw (4) slowly in the reverse way and stop turning the instant the error is displayed.
- * Air pressure of 0.40 Mpa or more is required to cancel this error display (due to pressure switch hysteresis)
3. After setting pressure at regulator (1) to 0.5 Mpa, reduce it gradually and confirm that error display indicates E820 for the first time at 0.34 Mpa.
 4. Air pressure (increase) : 0.5 Mpa Push the cap (1) down and lock it.

5-11. Adjusting speed of the pneumatic mechanism

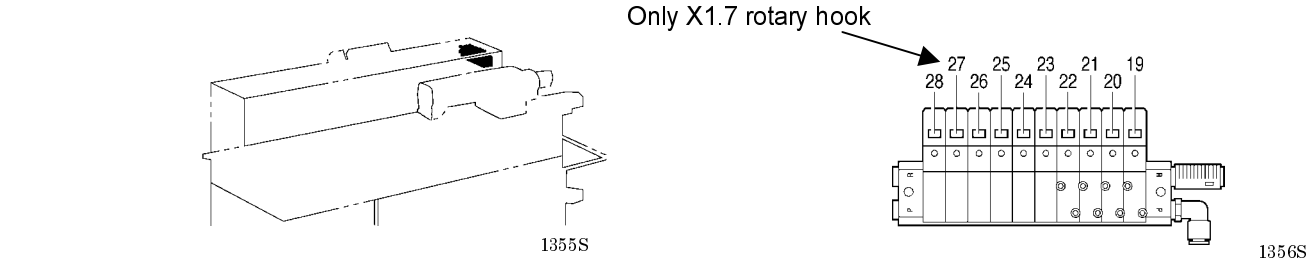
<The valves location of the folding machine>



Remove the cover while making this adjustment.

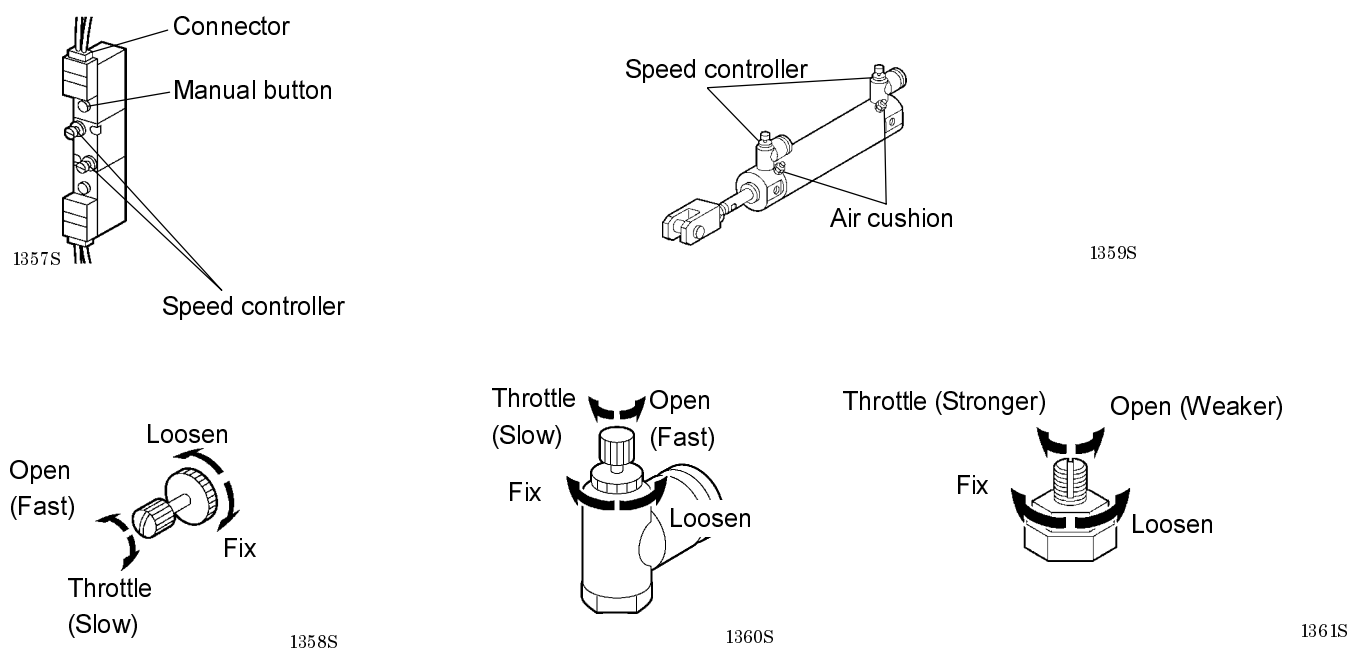
1	Folding clamp	6	Folding base (1.5 mm-stroke)
2	Inner clamp	7	Label attachment device (Option)
3	Center blade	8	Suction (Vacuum)
4	Sewing clamp	9	Slide plate elevator
5	Folding base (10 mm-stroke)		

<The valves location of the folding machine>



19	Stacker wiper	24	Needle blow
20	Stacker bar inside	25	Presser foot
21	Stacker bar outside	26	Zigzag
22	Roller	27	Main tension (X1.7 rotary hook)
23	Rotary hook blow	28	2 step tension

<Adjusting the pneumatic mechanism>



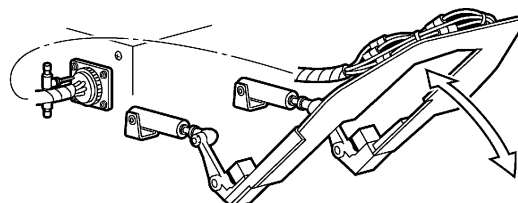
5-11-1. Folding clamp

Activate air compression. Turn on the power.

Attach the folding clamp and lock it. Attach the multi-connector.

Detach the connectors on valve 1B and valve 1A while making this adjustment.

Valve	Action by manual button	Setting of the speed controller
1B side	Raise	Turn the screw all the way but tighten lightly. Next, loosen the screw 3 turns. Fix the screw with the nut.
1A side	Descend	



1362S

Two cylinders	Setting of the air cushion
End side, Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.

Multi-connector	Setting of the speed controller	
 1363S	Raising speed	Make the operating speed as fast as possible without operating jostling of the folding clamp.
	Descending speed	

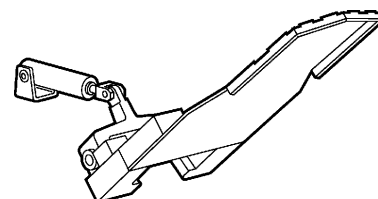
5-11-2. Inner clamp

Activate air compression. Turn on the power.

Attach the lightest inner clamp you have and lock it.

Detach the connectors on valve 2B and valve 2A while making this adjustment.

Valve	Action by manual button	Setting of the speed controller
2B side	Raise	Turn the screw all the way but tighten lightly. Next, loosen the screw 3 turns. Fix the screw with the nut.
2A side	Descend	



1364S

Cylinder	Air cushion		Setting of the speed controller
 1365S	End side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1 turn. Fix the screw with the nut.	Make the operating speed as fast as possible without operating jostling of the inner clamp. Full open → Fine adjustment
	Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.	

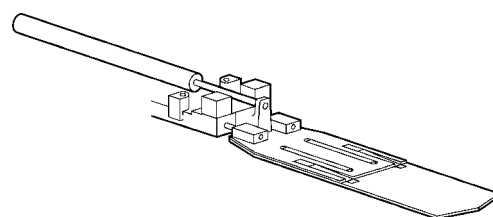
5-11-3. Center blade

Activate air compression. Turn on the power.

Attach the Center blade and lock it.

Detach the connectors on valve 3B and valve 3A while making this adjustment.

Valve	Action by manual button	Setting of the speed controller
3B side	Move toward you	Turn the screw all the way but tighten lightly. Next, loosen the screw 3 turns. Fix the screw with the nut.
3A side	Move away from you	



Cylinder	Setting of the air cushion
End side, Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.

1366S

5. ADJUSTMENT

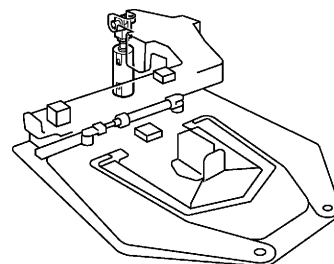
5-11-4. Sewing clamp

Activate air compression. Turn on the power.

Attach the Folding clamp and lock them.

Detach the connectors on valve 4B and valve 4A while making this adjustment.

Valve	Action by manual button	Setting of the speed controller
4B side	Raise	Turn the screw all the way but tighten lightly. Next, loosen the screw 3 turns. Fix the screw with the nut. If the ascending speed is too fast, the sewing clamp may be severely jolted and may interfere with the operation of the folding machine. If the ascending speed is too slow, the error number E970 may appear.
4A side	Descend	Turn the screw all the way but tighten lightly. Next, loosen the screw 3 turns. Fix the screw with the nut. It adjusts so that accuracy of folding cloth may not be affected. If the descending speed is too high, the pocket cloth will swell. If it is too low, the cloth will mismatch on being carried by the center blade.



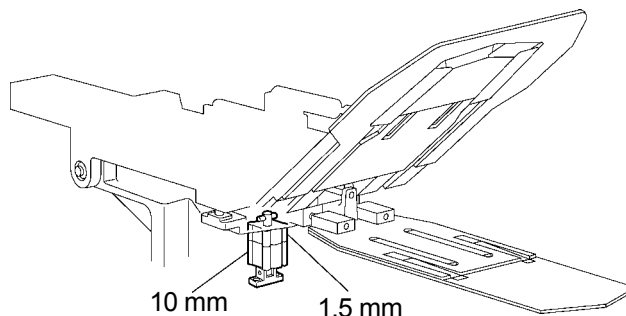
1367S

5-11-5. Folding base (10 mm-stroke)

Activate air compression. Turn off the power.

Attach the folding clamp, the inner clamp and the center blade and lock it.

Valve	Action by manual button	Setting of the speed controller	
5	Move up and down	For ascending (Manual button side), For descending	Adjust the base speed to allow movement at the highest possible speed without vibration at either end. The vibration will cause mismatching of cloth. Slow speed will hamper folding.



1368S

5-11-6. Folding base (1.5 mm-stroke)

Activate air compression. Turn off the power.

Attach the folding clamp, the inner clamp and the center blade and lock it.

Valve	Action by manual button	Setting of the speed controller	
6	Move up and down	For ascending (Manual button side), For descending	Adjust the base speed to allow movement at the highest possible speed without vibration at either end.

5-11-7. Label attachment device (Option)

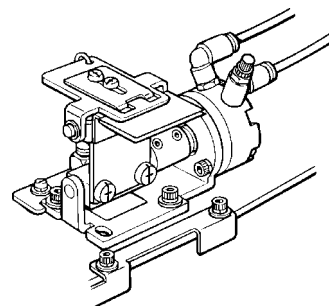
Before the speed adjustment, set the speed controllers to the minimum to prevent the set screws from being loosened by the shock.

Activate air compression. Turn on the power.

Valve	Action by manual button	Setting of the speed controller	
7	Turn	For inserting	When inserting the label, reduce the speed of the label attachment device to the extent that the machine still functions smoothly. If the speed is too high, vibration may cause miss positioning of the label.
		For return (Manual button side)	Open (Full)

Setting of the speed controller (Rotary cylinder)

Set the return speed to slow ; if the speed is too high, labels may shift due to the vibration. If an abnormal sound occurs when the cylinder reaches its ends, the set screws may become loose.
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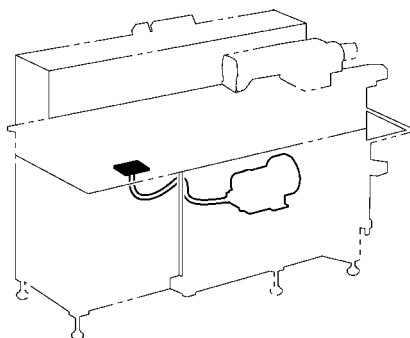


1369S

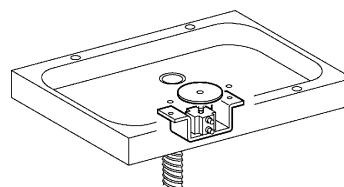
5-11-8. Suction (Vacuum) cylinder

Activate air compression. Turn on the power.

Valve	Action by manual button	Setting of the speed controller	
8	Suction (Vacuum), ON OFF	Suction (Vacuum) ON (Manual button side)	Adjust the speed to allow return at high speed without any jolting at either end.
		Suction (Vacuum) OFF	



1370S



1371S

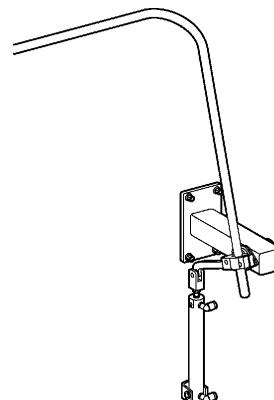
5. ADJUSTMENT

5-11-9. Stacker wiper

Activate air compression. Turn off the power.

Valve	Action by manual button	Setting of the speed controller	
19	Wiper---Move	Move toward you (Manual button side)	Make the operating speed as fast as possible without operating jostling of the stacker wiper.
		Move away from you	

Cylinder	Setting of the air cushion	
 1365S	Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.
	End side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.



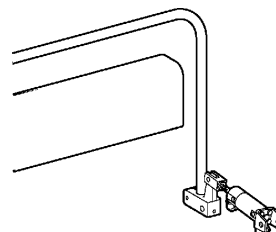
1372S

5-11-10. Stacker bar inside

Activate air compression. Turn off the power.

Valve	Action by manual button	Setting of the speed controller	
20	Bar---Move	Move toward you (Manual button side)	Adjust the speed to follow the stacker bar without jolting.
		Move away from you	Adjust low enough so as not to interfere with the cloth to be sewn next.

Cylinder	Setting of air cushion
End side, Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.



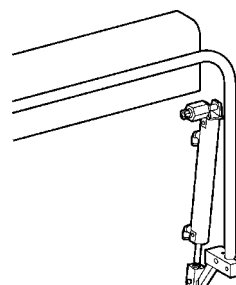
1373S

5-11-11. Stacker bar outside

Activate air compression. Turn off the power.

Valve	Action by manual button	Setting of the speed controller	
21	Bar---Move	Move toward you (Manual button side)	Make the operating speed as fast as possible without operating jostling of the stacker bar.
		Move away from you	Adjust the bar speed to allow movement at a highest possible speed where no abnormal sounds.

Cylinder	Setting of air cushion
End side, Rod side	Turn the screw all the way but tighten lightly. Next, loosen the screw 1.5 turns. Fix the screw with the nut.

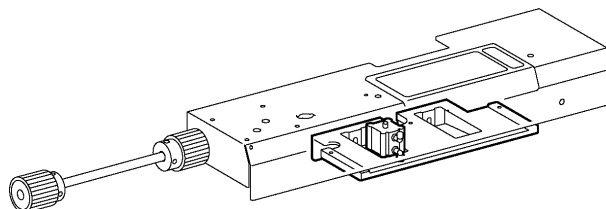


1374S

5-11-12. Stacker roller

Activate air compression. Turn off the power.

Valve	Action by manual button	Setting of the speed controller	
22	Up and down	For ascending (Manual button side),	Make the operating speed as fast as possible without operating jostling of the stacker roller.
		For descending	

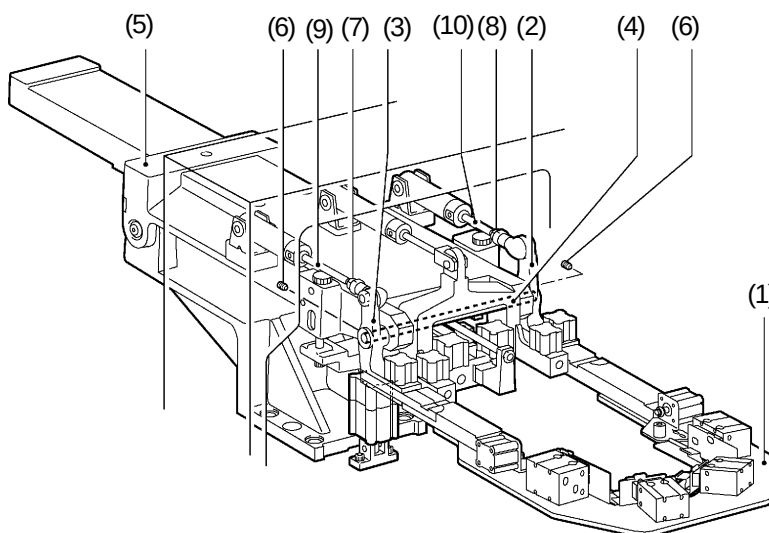


1375S

5-12. Adjusting the folding clamp

This adjustment may possibly spoil the compatibility of different models. Be sure to adjust the tucking blades on the folding machine in advance.

Activate air compression. Turn on the power.



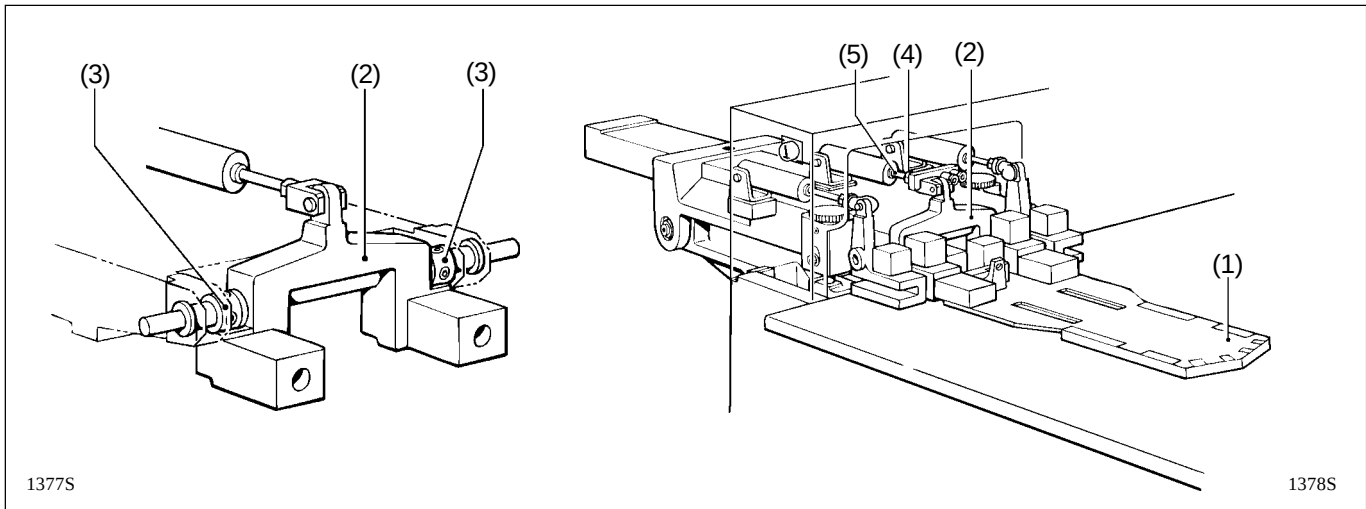
1376S

1. Set the step mode. (Press the [FOLDING MODE] switch.) Lower the folding clamp. (Press the [STEP] switch.)
 2. The arm R (2) and the arm L (3) : Same angle against the shaft (4), Not move sideways against the folding base support (5) Adjust → Loosen the six set screws (6)
 3. If the height of folding clamp is lower than the center blade when the clamp is down, the outer dimension of the pocket will be larger or the pocket will swell. If it is higher than the center blade, the clamp will touch the blade and the tacking blade will not be able to move.
Loosen the two rod nuts (7), (8) and adjust the height of the folding clamp (1) by giving same amount of turns on the right and left rods (9), (10). Since the size of the rods (9), (10) are M10, P1.25, each turn will move them 1.25 mm.
- * Be sure to confirm folding group features with AUTO mode (Change mode → Press [FOLDING MODE] switch).

5-13. Adjusting the inner clamp

Compatibility of different models may be lost through this adjustment.

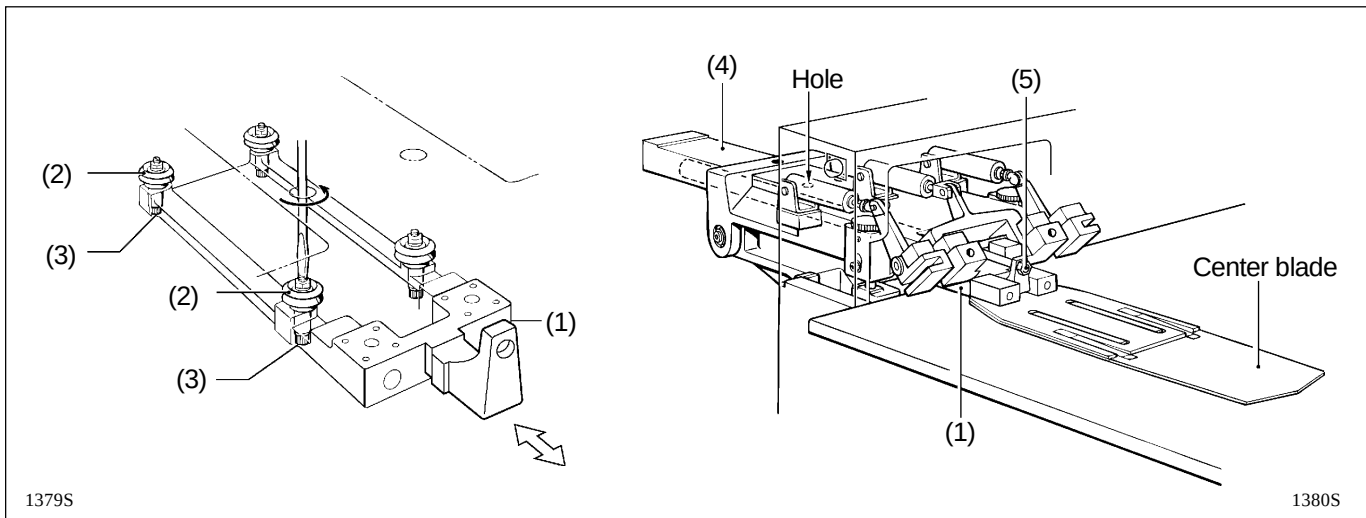
Activate air compression. Turn on the power.



1. Set the step mode. (Press the [FOLDING MODE] switch.) Lower the inner clamp (1). (Press the [STEP] switch.)
 2. Secure the inner clamp lever (2) as its longitudinal direction is accurately positioned by the two collars (3).
 3. If the inner clamp is too high, the pocket cloth on the center blade cannot be clamped properly when the inner clamp comes down. If it is too low, the height is not convenient for the operator when the clamp goes up and the air cushion for the cylinder will not work when it comes down. Adjust → Loosen the nut (4), Turn the rod (5)
Since the size of the rod is M8 and P1.25, each turn will give 1.25 mm of movement.
- * Be sure to select AUTO mode to confirm folding mechanism features. (Press the [FOLDING MODE] switch.)

5-14. Adjusting the center blade support

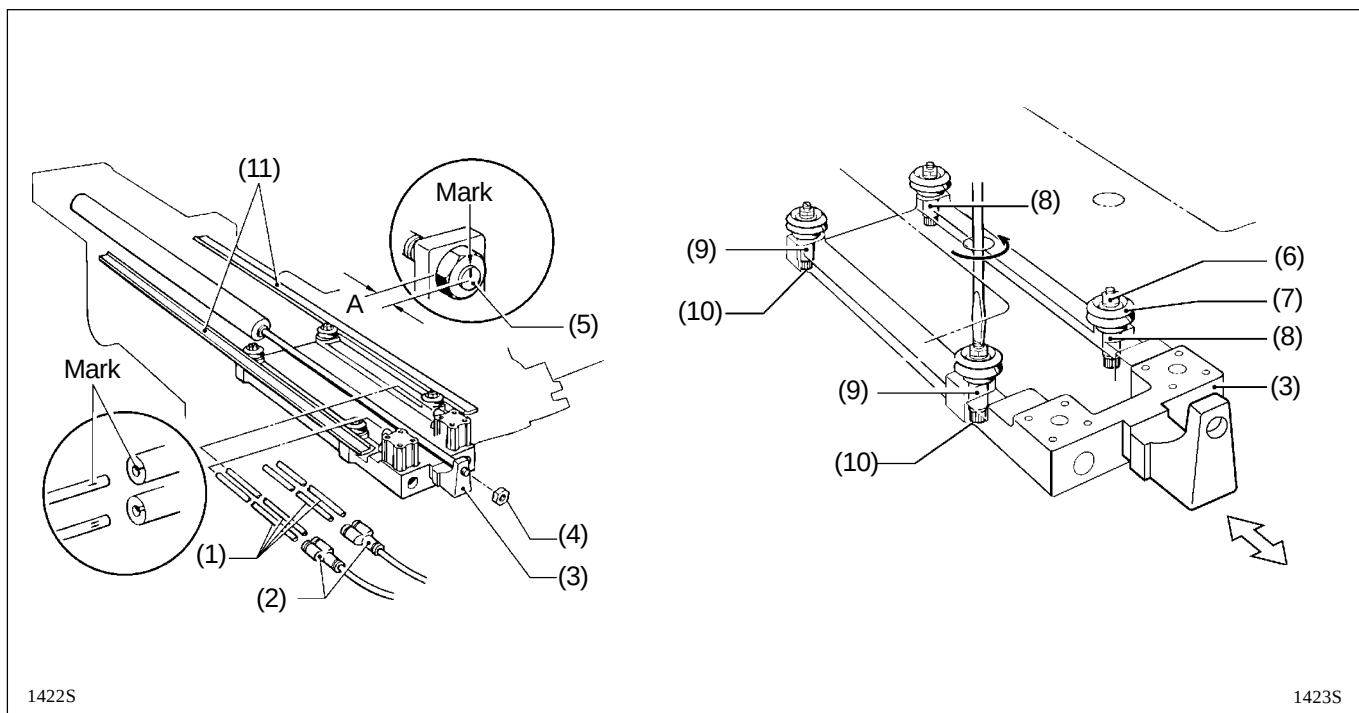
Activate air compression. Turn off the power.



- The center blade support (1) : Smooth, The each bearing of the center blade : Revolve under finger pressure
Adjust → Loose the two bolts (3), Lightly turn the two eccentric shaft on the left counterclockwise with a screw driver through a hole in the folding base (4).
- * Do not loosen the rod nut (5). (For adjustment in factory)

5-15. Replacing and adjusting the bearings for center blade supporter

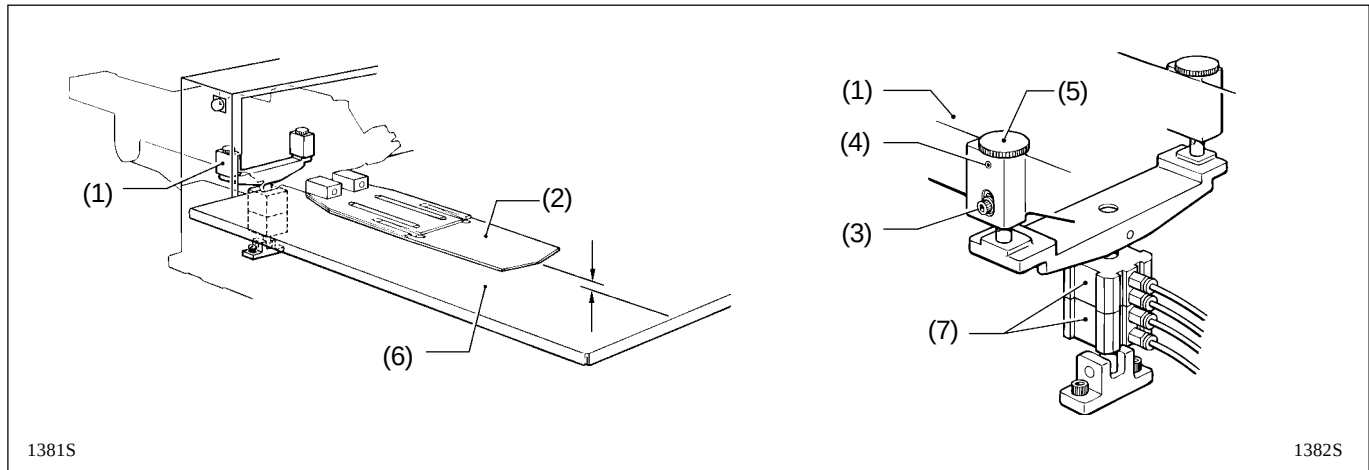
Activate air compression. Turn off the power.



1. Disconnect the four air tubes (1).
 - * Mark the air tubes (1) and union-Y4 (2) to prevent misconnection.
2. Pull the center blade supporter (3) toward you, loosen the nut (4), and remove the center blade supporter (3) by turning the rod end (5).
 - * Mark the rod end (5) position as illustrated above for reproducibility of the center blade supporter (3) installation. Deviation in installed position will greatly influence folding effect.
3. Remove the nut (6) on the bearing to be replaced. Replace the bearing (7) with a new one, and secure it using the nut (6).
4. Loosen the bolts (10), and replace the roller shafts (8), (9) if necessary.
 - * The coaxial roller shaft (8) is on the right and the eccentric roller shaft (9) is on the left.
 - * No adjustment is required when replacing the coaxial roller shaft (8) only.
 - * The following adjustment is required when replacing the eccentric roller shaft (9).
5. Secure the bolt (10) on the coaxial roller shaft (8) on the right. Move the bearing (7) inward by turning the eccentric roller shaft (9), and temporarily tighten the bolt (10).
6. Place the center blade supporter (3) on the rails (11). Adjust the bearing (7) by turning the eccentric roller shaft (9) with the screwdriver to allow smooth movement without play on the rail (11) walls.
 - * Adjust the eccentric roller (9) by turning it counter clockwise when viewed from the top. Secure the bolt (10).
7. Check for smooth movement of the center blade supporter (3) and rotation of each bearing (7) even under finger pressure.
 - If the bearing (7) slips on the rail, re-adjust the eccentric roller shaft (9).

5-16. Adjusting the folding base height

Activate air compression. Turn off the power.

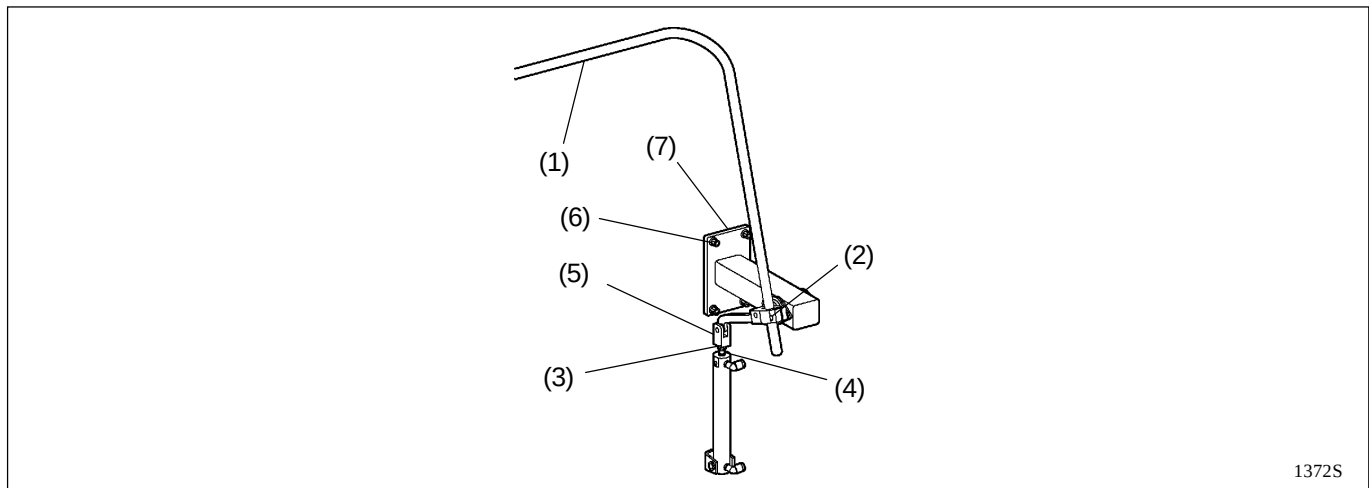


Height of the folding base (1) : Some resistance can be felt when the front cloth is clamped at the lowest point of the folding base. Adjust → Loosen the two screws (3) and two set screws (4), Turn the two adjusting screws (5) clockwise (when viewed from upper side) to increase the clearance between the center blade (2) and the needle plate (6), Turn them counterclockwise to decrease the clearance, Give exactly the same amount of turn on right and left

- * Be sure to balance the height on right and left, otherwise the cylinder (7) for the folding base may fail to move.
- * While turning the adjusting screw (5) counterclockwise, forcibly press against the folding base to reduce the gap between the adjusting screw (5) tip and the adjust shaft end.

5-17. Adjusting the stacker wiper

Activate air compression. Turn off the power.

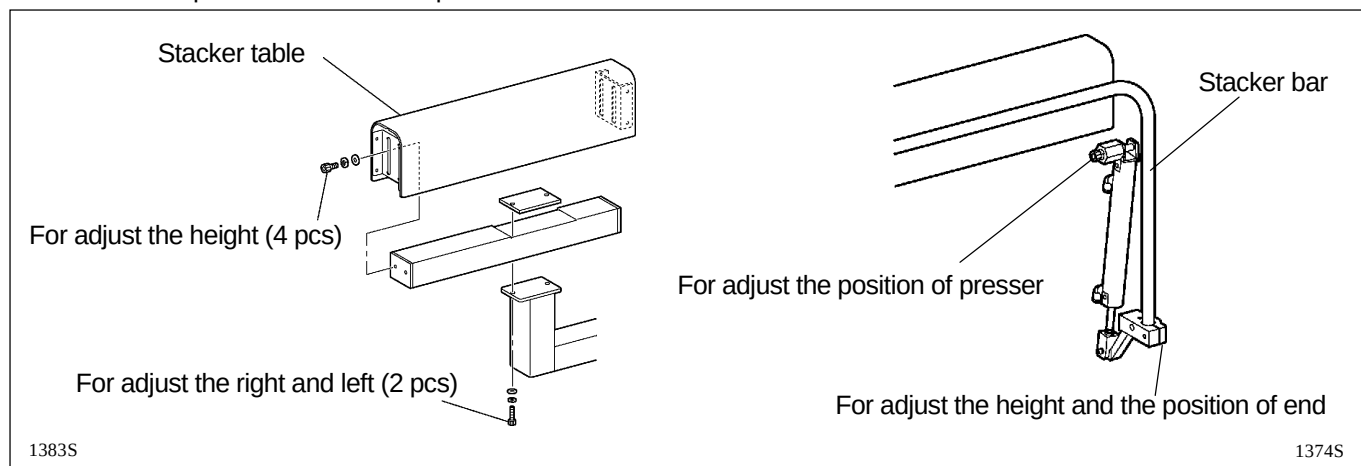


The stacker wiper (1) : Do not touch the front cover when it returns after operation, If the wiper position is too close to the operator, the front cloth ready to be sewn may be caught.

1. Adjust (Height, Angle of front and rear) → Loosen the bolt (2)
 2. Adjust (Angle at the stand-by position) → Loosen the nut (3), Turn the rod (4)
- * Tighten the rod nut (3) at the rod end for 5 mm deep or more. If it is not in adjustable range, loosen the four bolts (6), and adjust by vertically the moving base (7) which enables a large amount of adjustment.

5-18. Adjusting the stacker table and the outside stacker bar

Release air compression. Turn off the power.



Adjust the outside stacker bar at the same time.

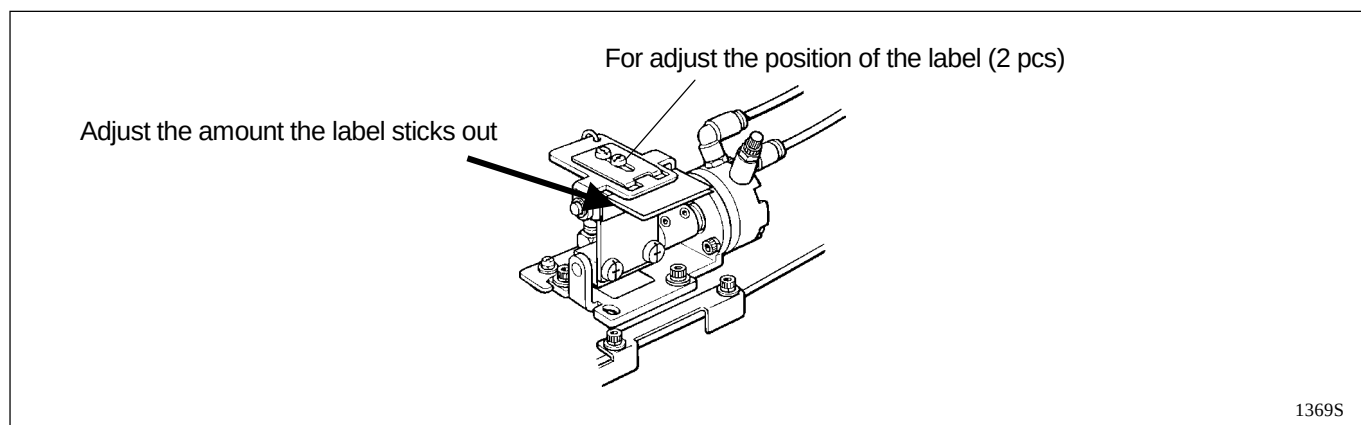
Height of the outside stacker bar : As high as the middle of the stacker table

Angle of the outside stacker bar : Point end of the outside stacker bar a little inward

5-19. Checking the movement of the stacker

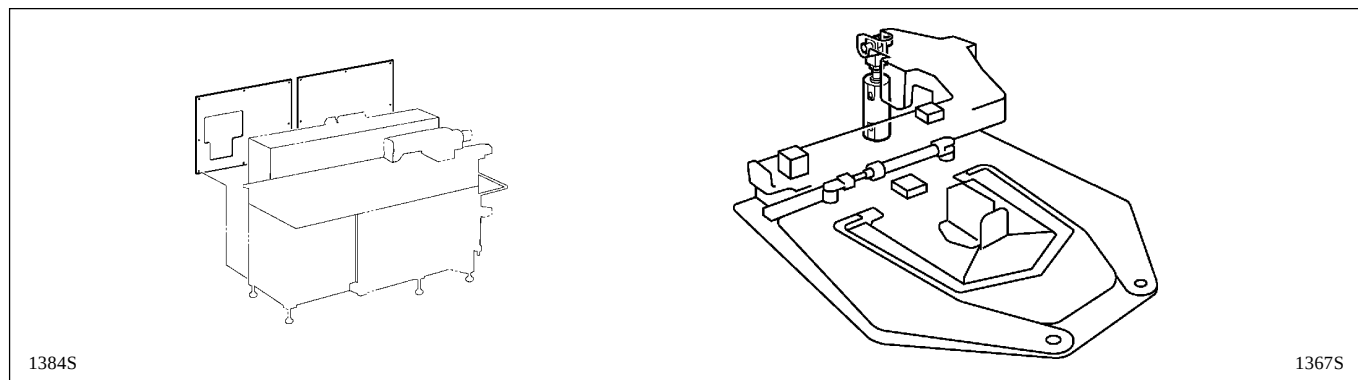
1. Turn on the DIP switch A-8.
2. Turn on the power.
It will be in a "sewing machine rotation check" state.
3. Press the [STACKER] switch.
4. Choice the amount of rotations of the stacker roller by the key $\Delta \nabla$. (Nine stages to 0 to 400 mm)
5. Step on the foot switch, then a series of the stacker operation is performed.

5-20. Adjusting the label attachment device (option)



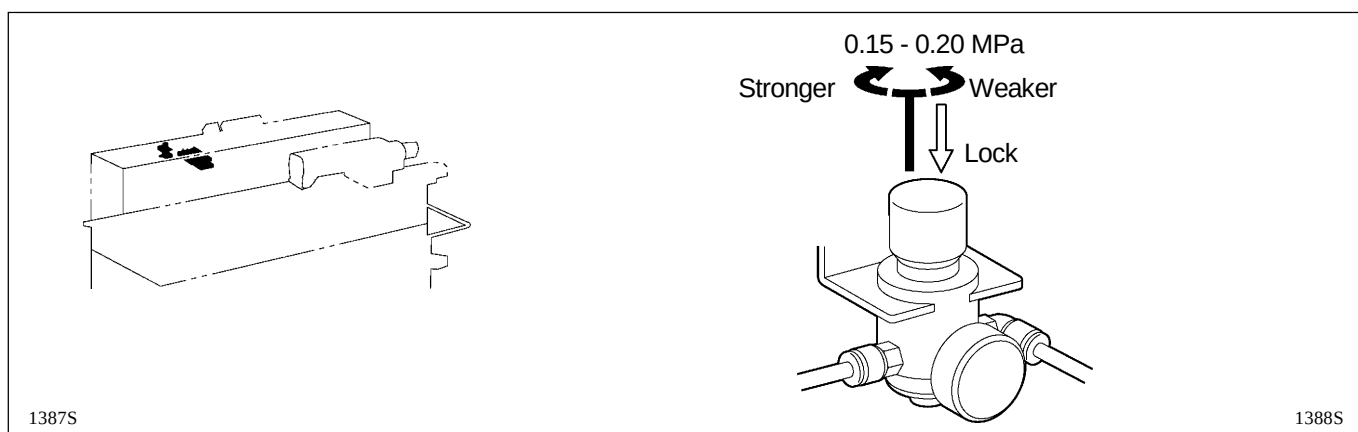
Pneumatic adjustment → Refer to "5-11-7. Label attachment device (Option)".

5-21. Adjusting the work clamp pressure



Activate air compression. Turn off the power.
Remove the either rear cover while making this adjustment.

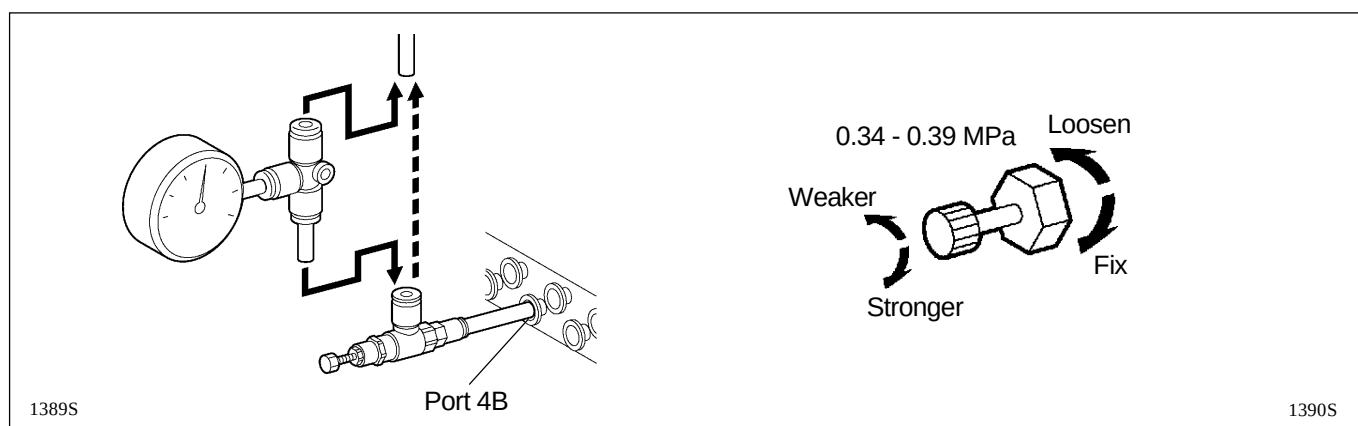
<Pressure adjustment (when sewing clamp is lowered)>



Pressure will change greatly by turning the cap only a little. Be sure to press the manual buttons A, B of the valve No.4 alternatively to check for pressure.

* This pressure greatly influences folding.

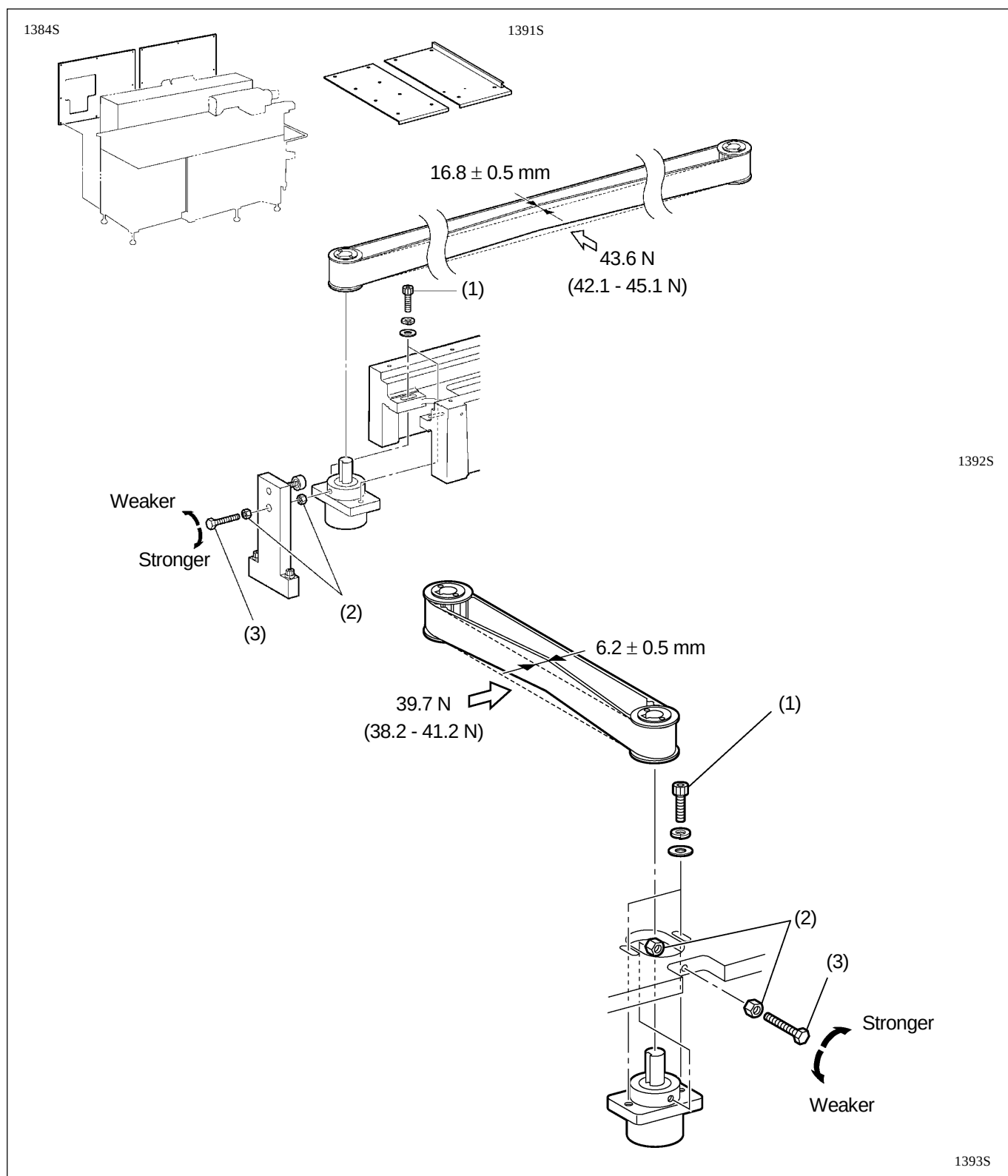
<Pressure adjustment (when sewing clamp is raised)> Pressure gauge is necessary.



Pressure will change greatly by turning the cap only a little. Be sure to press the manual buttons A, B of the valve No.4 alternatively to check for pressure.

* If the pressure is too high, the device vibrates greatly when the sewing clamp is raised. This may result in the interference with the folding machine gauge. If the pressure is too low, the sewing clamp sensor activates and "E970" is displayed.

5-22. Adjusting the belt tension

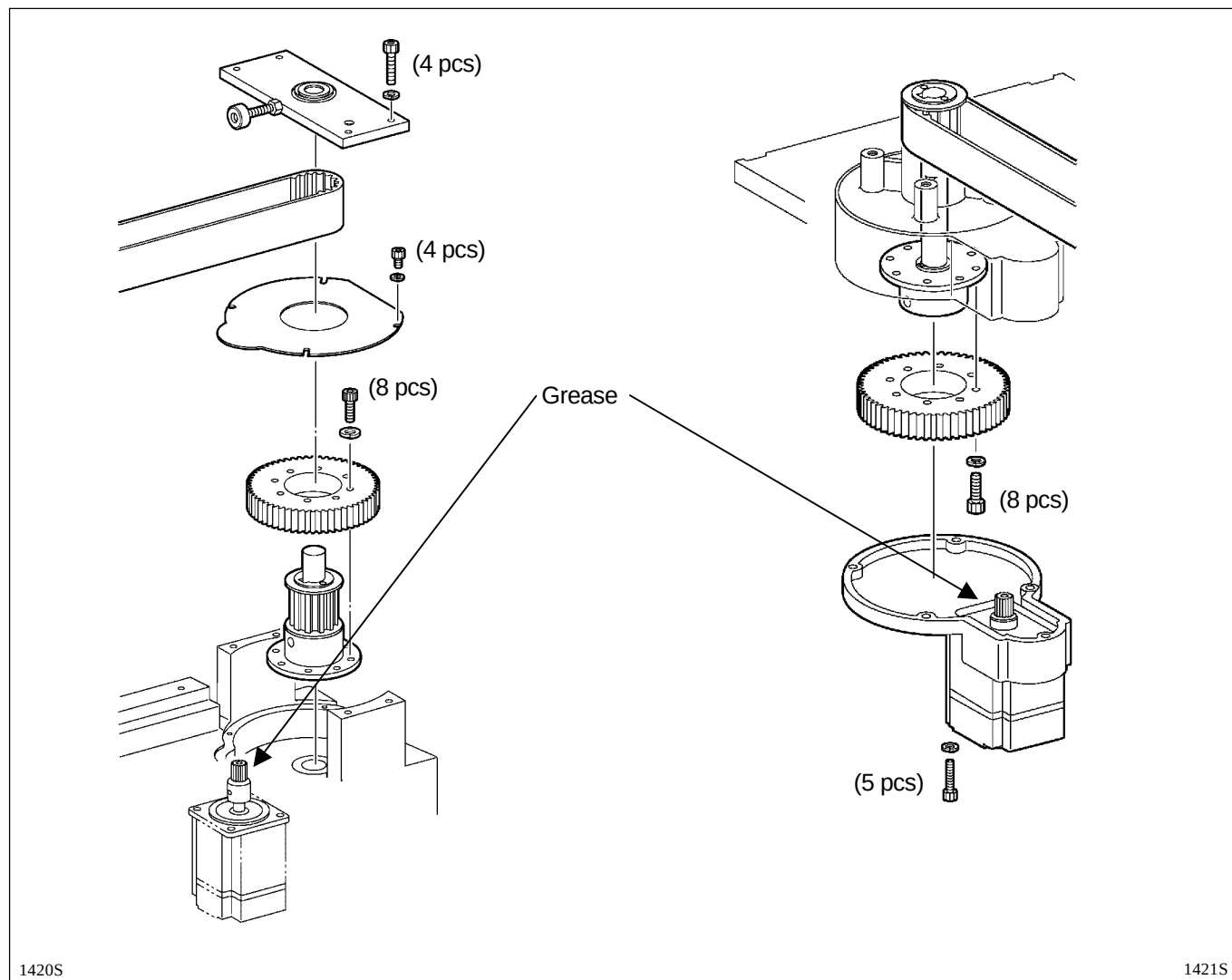


Remove the rear covers (X-direction) and the needle plates (Y-direction) while making this adjustment.

The belt tension : Refer to the illustration. Adjust → Loose the two screws (1) and two nuts (2), Turn the bolt (3)

* Insufficient belt tension results in inaccurate needle entrance ; excessive belt tension shortens belt use life.

5-23. Replacing the nylon gears

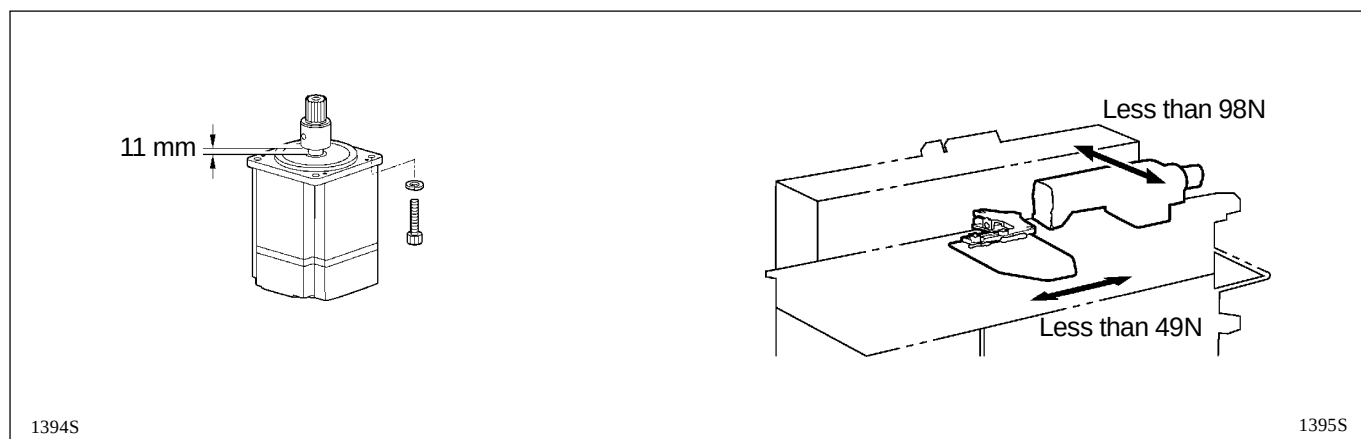


After removing the timing belt, exchange the nylon gear .

Loosening and adjustment of the timing belt → Refer to “5-22. Adjusting the belt tension”.

5-24. Adjusting the AC servo motor backlash

Release air compression. Turn off the power.

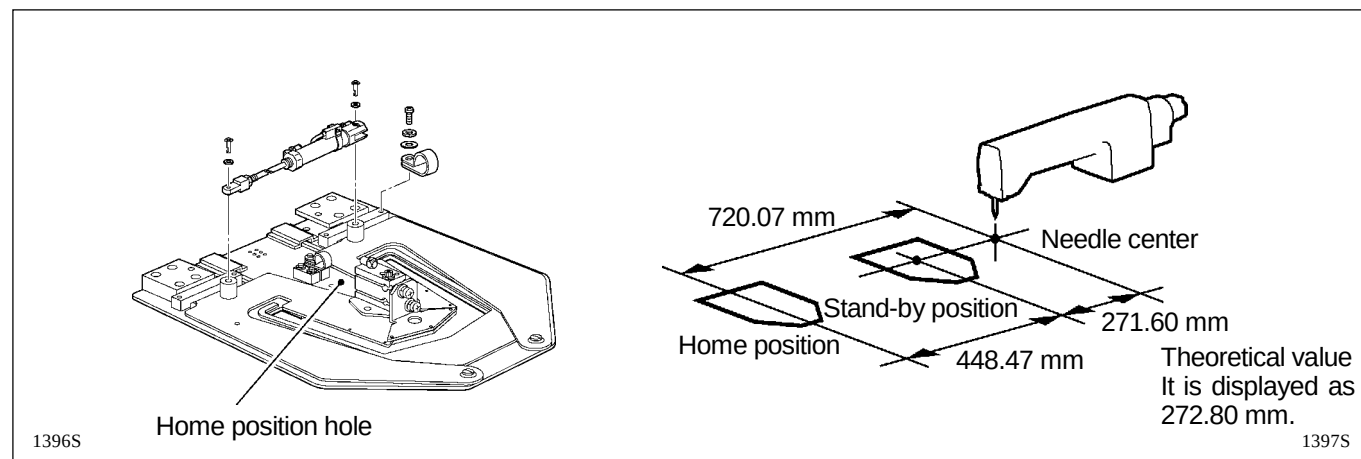


Remove the needle plates, the rear covers and the right side cover while making this adjustment.

The load (Power OFF) : Refer to the illustration. Adjust → Loosen the four bolts of the AC servo motor

5-25. Checking and adjusting the home position

* Compared with the BAS-750/751, Y home position is located 5 mm closer toward you. BAS-760 is the same position.

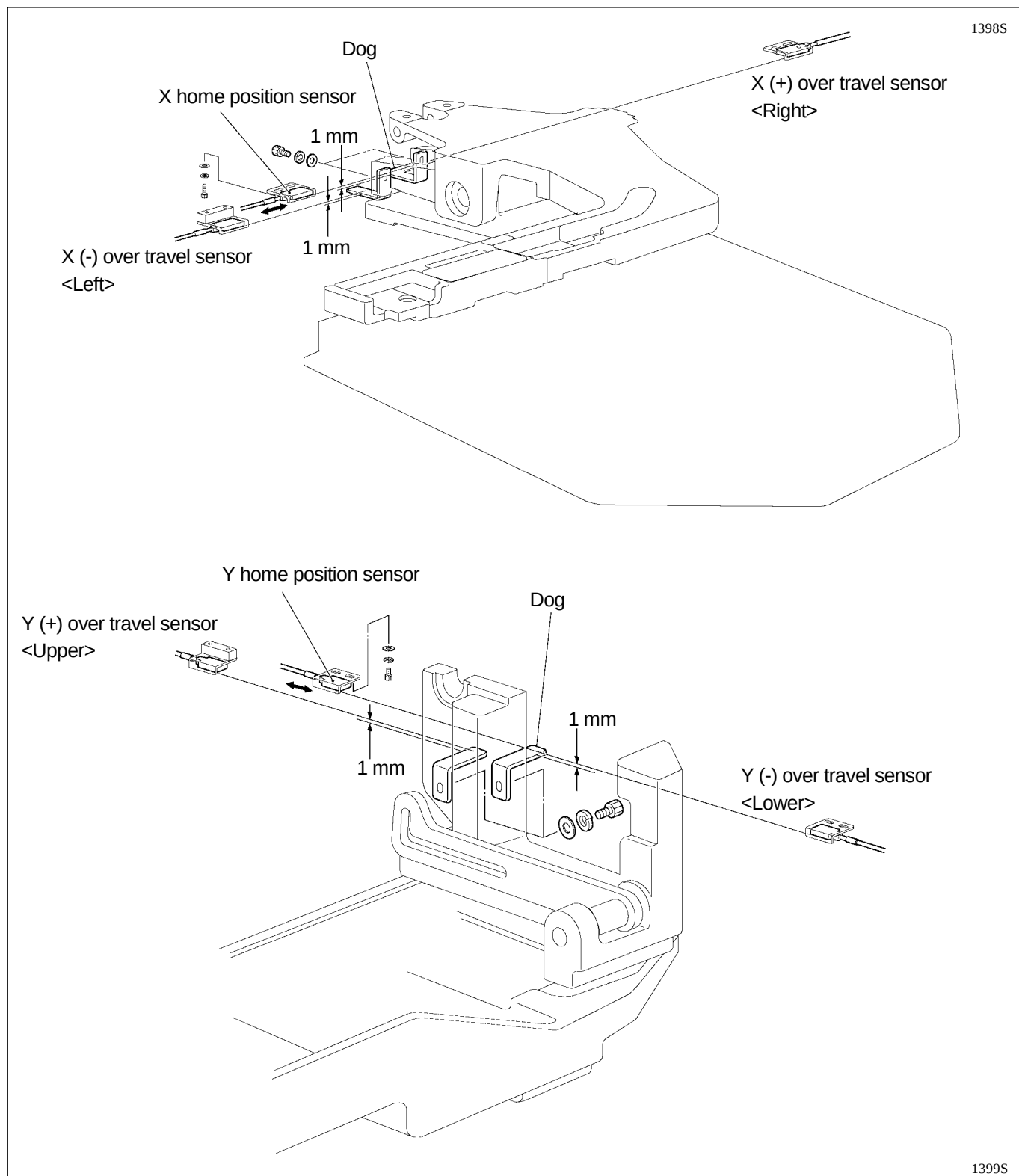


Remove the rear covers and the right side cover while making this adjustment.

1. Turn off the power. Install and lock the sewing clamp. Attach the programmer.
Retractable-type sewing clamp → Remove parts : ex.--- Refer to the illustration. (Presser of the machine touch the parts of the sewing clamp.)
2. Turn on the power. Press the reset switch of the sewing clamp. The sewing clamp will move left and then right, and stop at the stand-by position. (Checking of the home position) Spread the cloth under the sewing clamp.
3. Press "P" to obtain programming state.
4. Use the direction keys to locate the needle in the center of the home position hole of the sewing clamp. The programmer display should show X-direction=271.60 mm, Y-direction=0 mm.

* When the display does not suit, the following page "Adjusting the location of X (Y) home position sensor" is adjusted.

5. ADJUSTMENT



<Adjusting the location of X (Y) home position sensor>

5. Adjust → Position of the X, Y home position sensor, Loosen the screw, Move the home position sensor

* If the control panel indicates error code E510, press the reset switch, move the needle bar to the highest position (flashing light will go off) and press the green START switch.

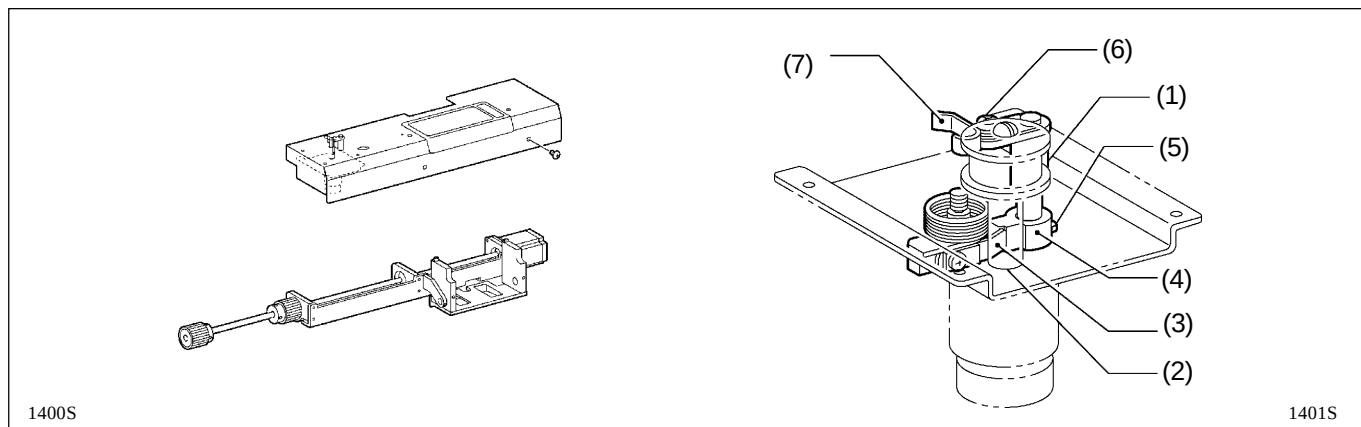
6. After adjustment, raise the needle to its upper point, and press [R]. The sewing clamp will move to stand-by position.

7. Press "P" again to release the programming state. Programmer display will go off.

8. Turn off the power. Repeat procedures 2.-7. to adjust the home position.

* Each sensor : Detect the dog → LED go out Adjust → Gap of the sensor and the dog is 1 mm.

5-26. Adjusting the bobbin winder



<Positioning the bobbin winder claw>

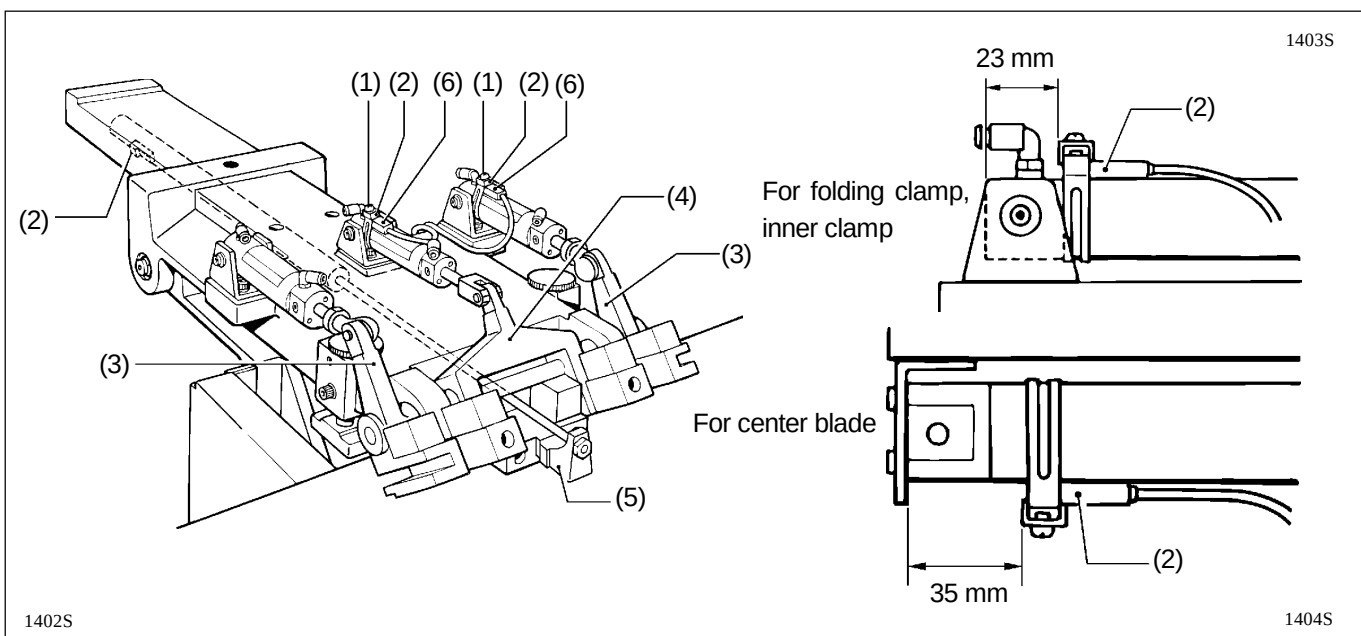
1. Move the bobbin holder arm (1) in direction of the bobbin winder shaft (2) to a position just before finishing bobbin thread winding.
2. Tighten the two screws (3) so that the spring plate (4) will be positioned on a stepped part of the bobbin winder claw (5).

<Positioning the bobbin holder arm>

Loosen the screw (6), and adjust the bobbin holder arm (7) by turning it to set proper thread amount.

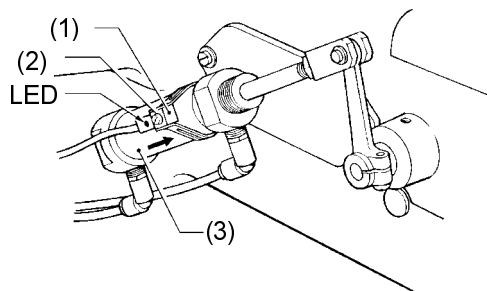
5-27. Adjusting the cylinder sensors

Release air pressure and turn on the power. Remove all folding mechanism parts.



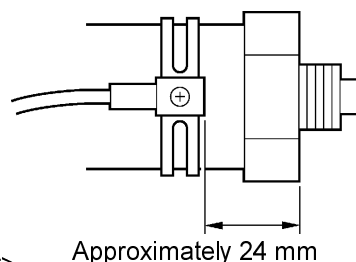
1. Adjust → Loosen the screw (1), Move the sensor (2)
 2. Manually operate the folding group support arm (3), the inner clamp lever (4), and the center blade supporter (5). Then adjust them so each LED of sensors (6) will come on for the first time when it is about 5 mm before stroke end of each cylinder.
- * Although each LED of sensors (6) comes on within the range of 10 mm before stroke end of each cylinder, adjust the sensors so that each of LED lights, as much as possible, in the middle of this range.

5. ADJUSTMENT



1347S

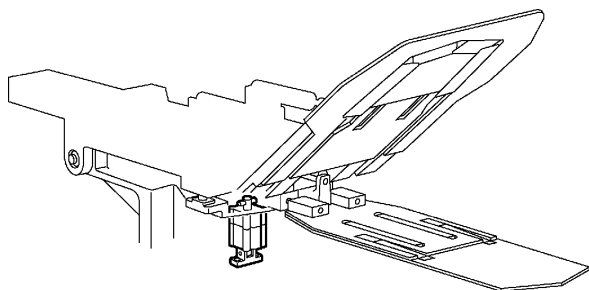
<Presser foot>



Approximately 24 mm

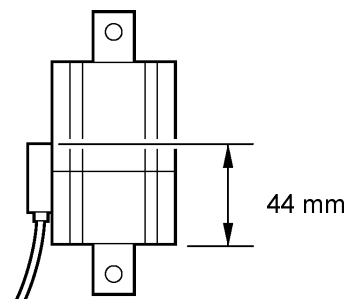
1683S

Adjust the sensor (1) in the middle of the indicator on the sensor (1) lights within a certain range. When the power is ON and the presser foot is up, the indicator on the cylinder sensor lights within a certain range when slowly raising the sensor (1) along the cylinder (2) from bottom to top.



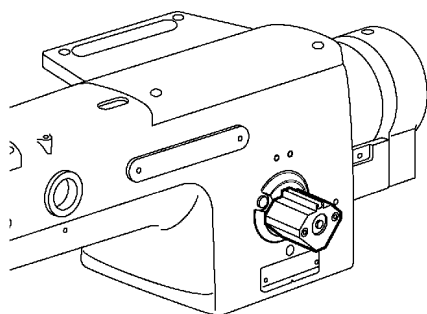
1684S

<Folding base>



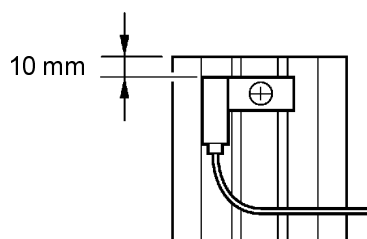
44 mm

1685S



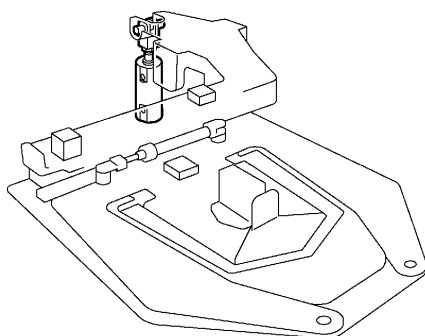
1686S

<Zigzag>



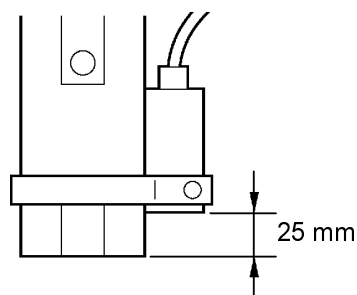
10 mm

1687S



1688S

<Work clamp>

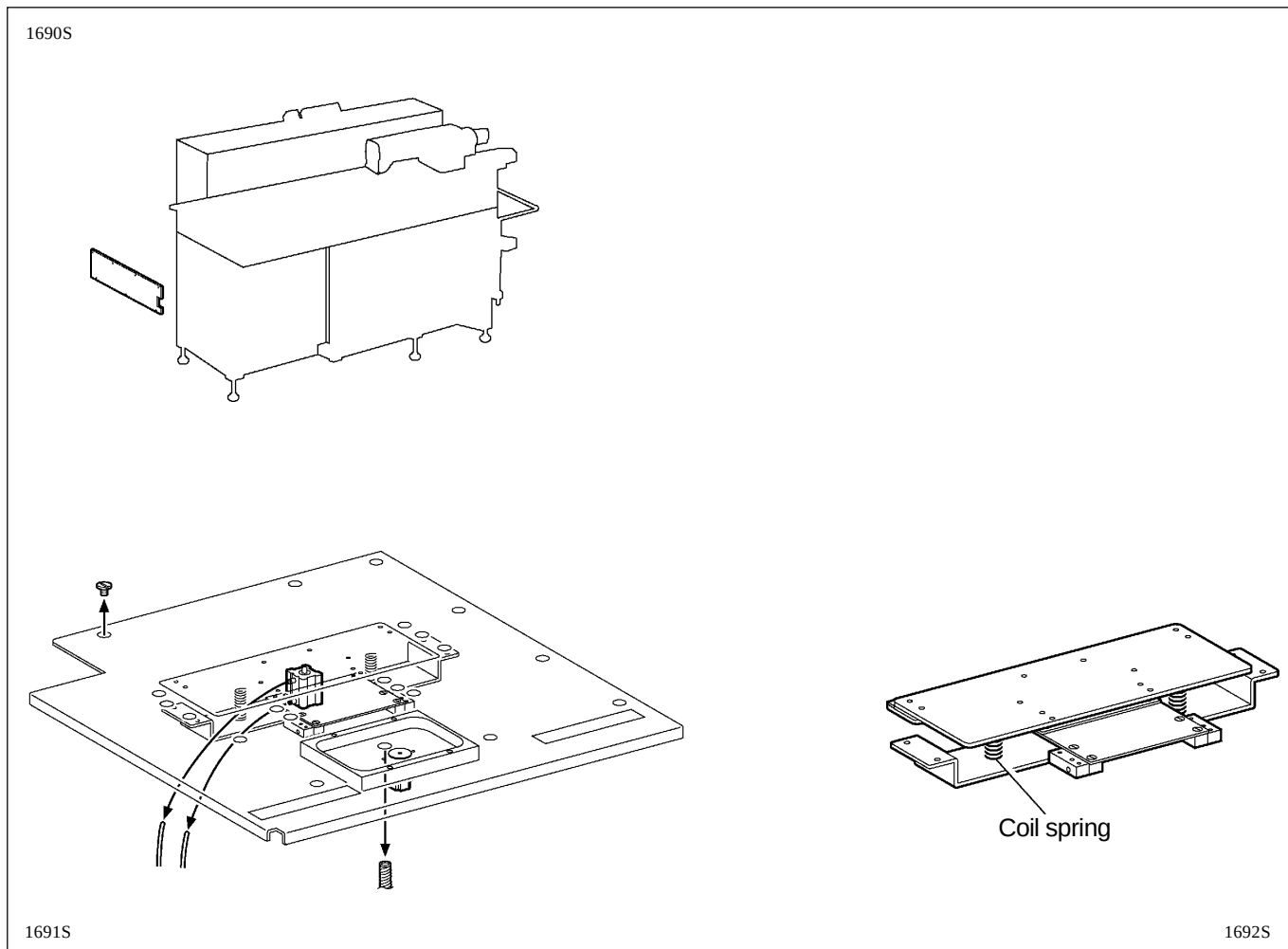


25 mm

1689S

5-28. Adjusting the rise-and-fall equipment

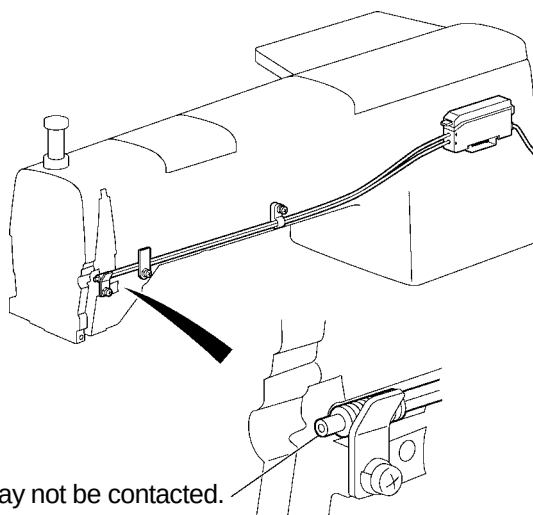
When the tucking blade and the center blade evacuate and cloth shifts, spring pressure of rise-and-fall equipment is checked.



Adjust the spring pressure of rise-and-fall equipment by the number of coil springs.

The coil spring can be increased to four pieces. (Two pieces are equipped at the time of shipment. Two pieces are appended as accessories.)

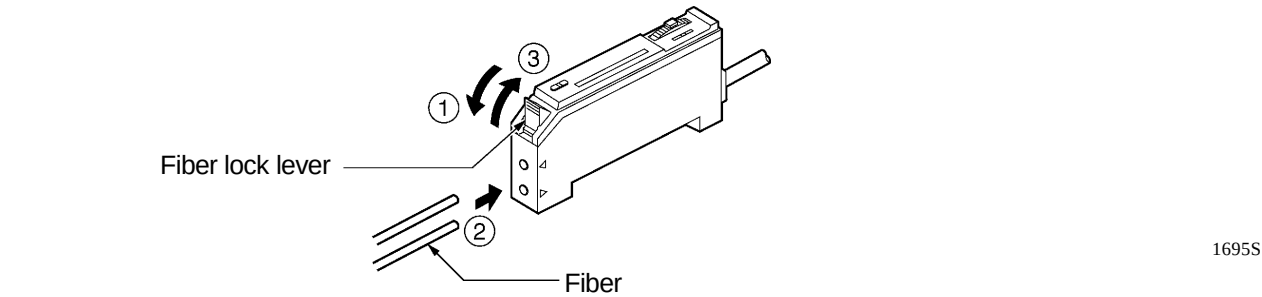
5-29. Upper thread breakage sensor.



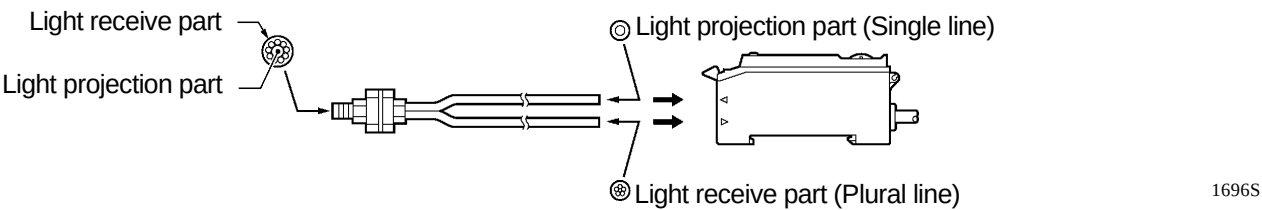
1693S

5-30. Adjusting the upper thread breakage detector

5-30-1. How to insert the fiber

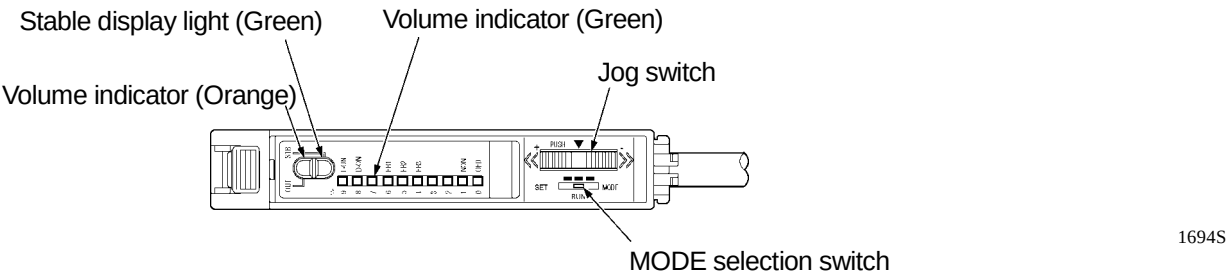


The fiber is inserted till the place at which it stops.
(Detection distance will become short if it fixes on the way.)



If a fiber makes light projection and light receive side reverse, detection accuracy will fall.

5-30-2. Setting of MODE



While making adjustment, the mode selection switch is changed to the "MODE" side. (The volume indicator under setup blinks.)

It will be set up if the jog switch is pushed, and the display of the volume indicator changes.

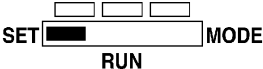
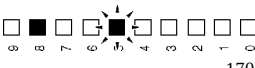
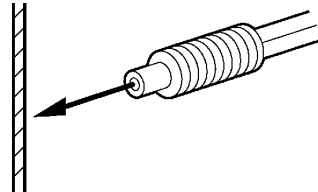
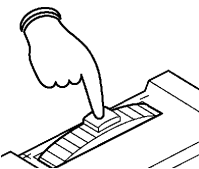
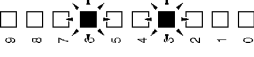
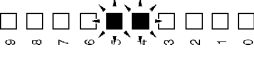
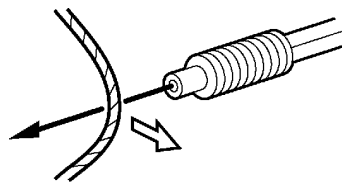
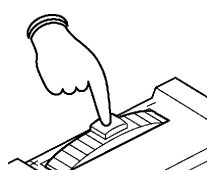
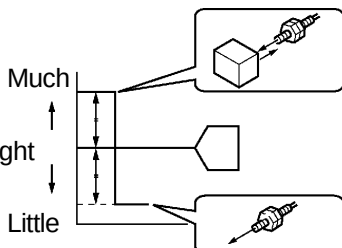
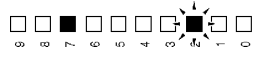
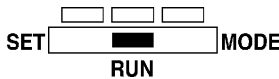
The jog switch is turned to + or -, and the contents are changed.

After a setting end and the mode selection switch is changed to the "RUN" side.

Setting item	Volume indicator	Contents of selection
Output operation	L-ON D-ON FR1 FR2 FR3 NON OFD 9 8 7 6 5 4 3 2 1 0 1697S	D-ON (When light does not enter : ON)
Frequency of light projection	L-ON D-ON FR1 FR2 FR3 NON OFD 9 8 7 6 5 4 3 2 1 0 1698S	FR1 (Frequency of light projection 1)
Timer operation	L-ON D-ON FR1 FR2 FR3 NON OFD 9 8 7 6 5 4 3 2 1 0 1699S	NON (With no timer)

5-30-3. Setting of sensitivity

It adjusts, after performing thread through to usual.

Procedure	Operation	Volume indicator
1	 The mode selection switch is changed to the "SET" side.	
2	1703S  1704S  If the jog switch is pushed when thread is on a sensor line, "3" of the volume indicator and "6" will blink. If the jog switch is detached within 3 seconds, "4" of the volume indicator and "5" will blink and the quantity containing light in case there is thread will be read. (If The mode selection switch is changed to the "RUN" side while "4" of the volume indicator and "5" are blinking, the quantity containing light will not be updated.)	1705S  1706S 
3	1708S  1704S  Thread is removed from a sensor line and the jog switch is pushed.	
4	1709S  Quantity containing light Much Little There is a work. Sensitivity level There is no work. Stable display light lights up and a sensitivity level is set up. A sensitivity level is set up in the middle of quantity containing light the time of there being thread, and in case there is nothing.	Sensitivity level display 100 grades → lighting 10 grades → blink Grade of 1 → nothing Example → 720-729 
5	 The mode selection switch is changed to the "RUN" side.	

6. ELECTRIC COMPONENTS

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

6-1. Precautions at the time of adjustment

Pay attention to the following when opening the control box for maintenance.

[Electric shock]

Some large capacitors may have a high voltage remaining in them for up to 5 minutes after the power is turned off. To prevent electric shock, wait at least 5 minutes after the power is turned off before doing the following:

- Opening and closing the control box
- Replacing fuses
- Replacing each PCB
- Separating and joining connectors
- Measuring resistance
- Doing anything with a possibility of touching something inside the control box

Some adjustments require measuring the voltage while the power is turned on with the control box kept open.

In such a case, be careful not to touch any place other than that for the measurement. In addition, always keep in mind that a high voltage remains for 5 minutes after the power is turned off.

[Injury]

When separating or rejoining connectors, and measuring something, be careful not to cut your fingers on metal parts such as heatsinks and covers.

6-2. Components inside the control box and the operation panel

The following are brief explanations of components inside the control box. See control circuit block diagram for the details of the connections.

< Control circuit board >

The main circuit board is fixed to the front of the control box.

< Power supply unit (Power supply transformer 2, switching power supply and power supply PCB) >

The power supply circuit board is fixed at the bottom front part of the control box. Four fuses are attached in this equipment.

< Power supply transformer 1 >

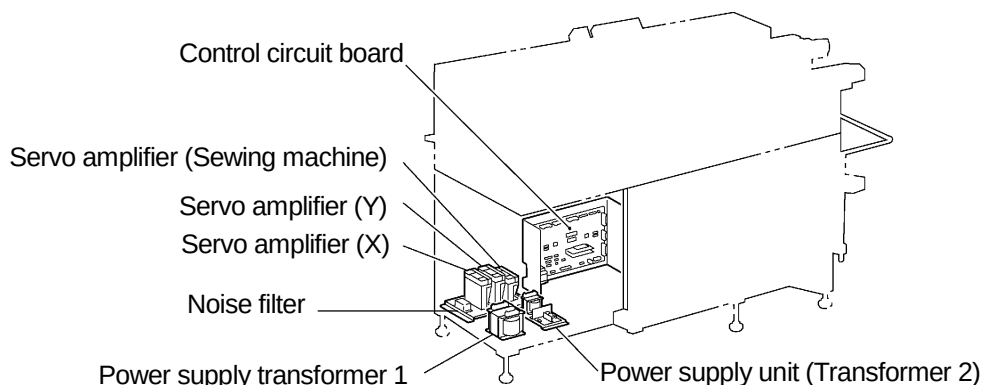
It changes into the voltage for which power supply equipment and servo amplifier need power supply voltage.

< Servo amplifier >

This is equipment which controls a servo motors (X, Y, Sewing machine).

< Noise filter >

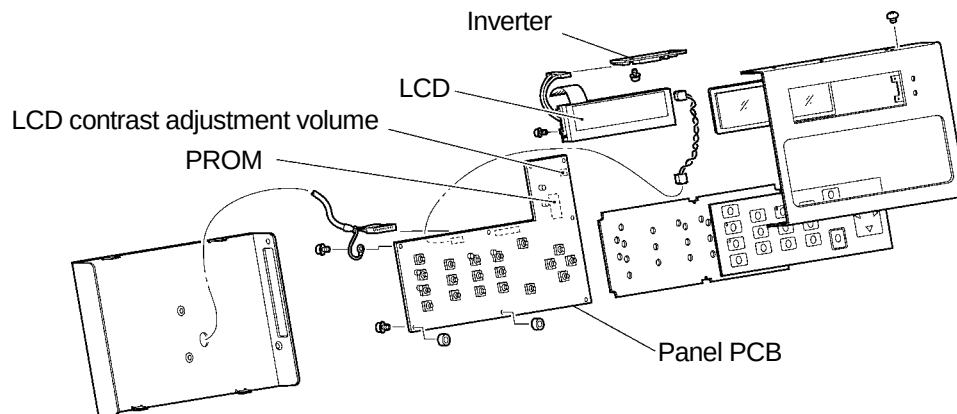
The power supply line noise of AC servo amplifier is reduced.



1763S

<Operation panel>

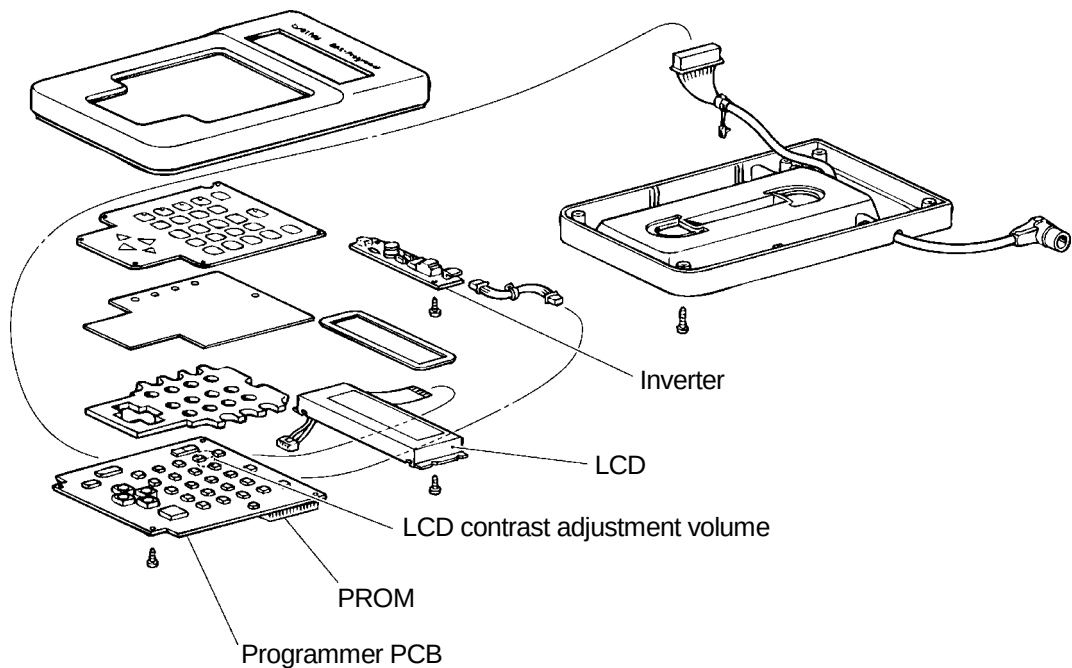
The panel PCB is fixed to the inside of the operation panel. It is a PCB which controls the switch of a panel, and the display to a LCD (liquid crystal display).



1764S

<Programmer>

The programmer PCB is fixed to the inside of the programmer. It is a PCB which controls the switch of a programmer, and the display to a LCD (liquid crystal display).



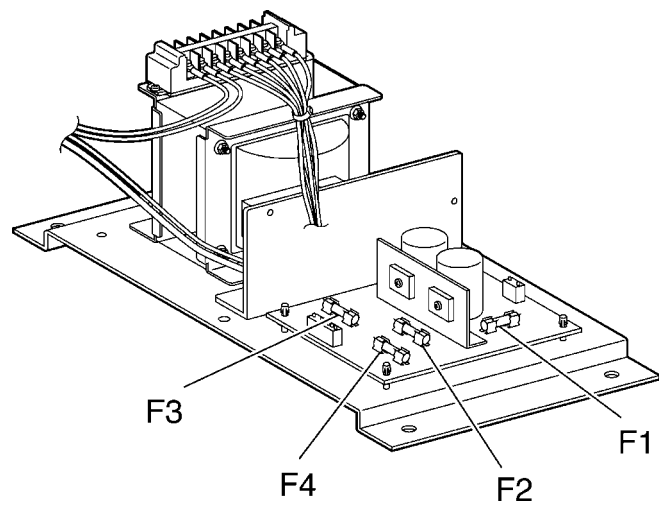
1765S

6-3. Power supply

6-3-1. Fuse

Note

When replacing a fuse, be sure to use the specified ones listed below.

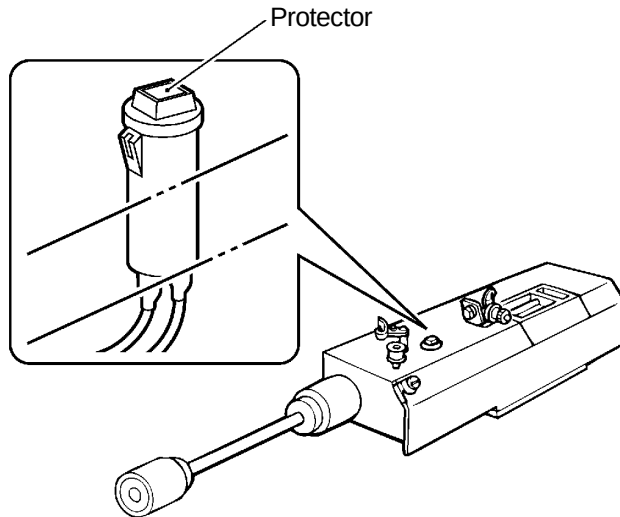


1766S

No.	Part name	Part code	Manufacturer	When a fuse has blown
F1	Fuse C (2A-125V)	152566000	SATO F7161 2A	The bobbin winder does not turn.
F2	Fuse B (5A-125V)	152565000	SATO F7161 5A	The air valve does not operate. The over travel sensor LED is not lit.
F3	↑	↑	↑	The stacker roller does not turn.
F4	↑	↑	↑	The light marker lamp is not lit.

6-3-2. Circuit protector of bobbin winder motor

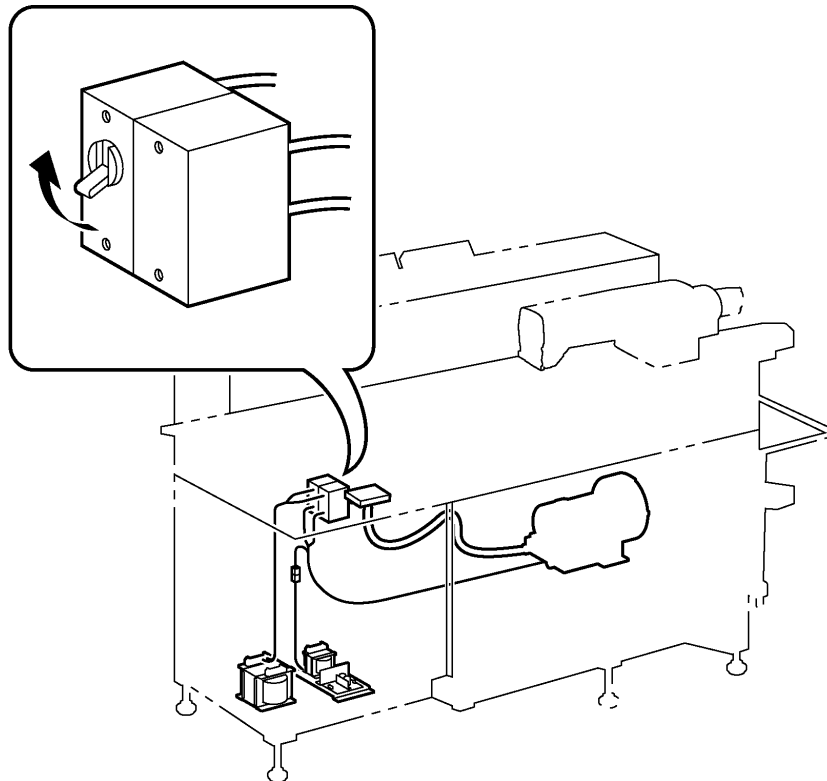
When winding thread on successive bobbins and with strong tension or the motor does not rotate for the thread has got tangled on the bobbin winder motor shaft, the protector will project to cut off the current to the circuit. After a while (about 30 seconds), depress the protector. Thread winding can be performed. Check the bobbin winder so that its tension is proper.



1767S

6-3-3. Breaker of suction (vacuum) device

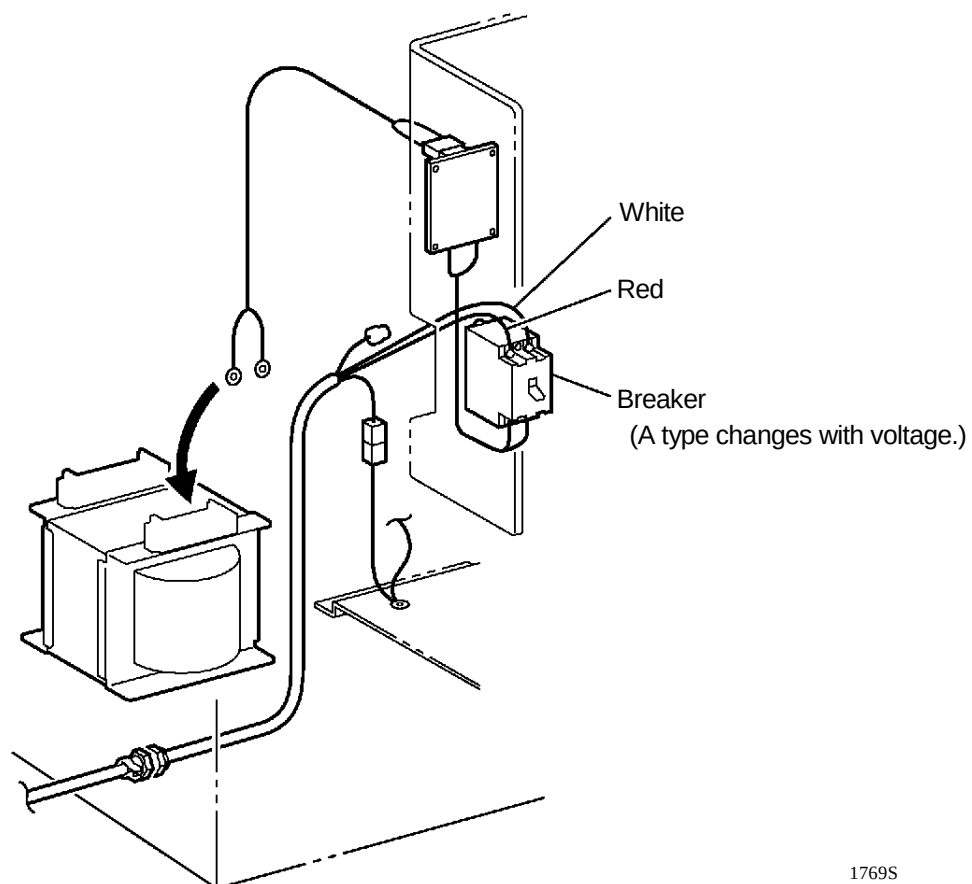
When excessive load joins suction device, the breaker of suction device operates. The breaker is returned after removing causes of load, such as cleaning of the filter of suction device.



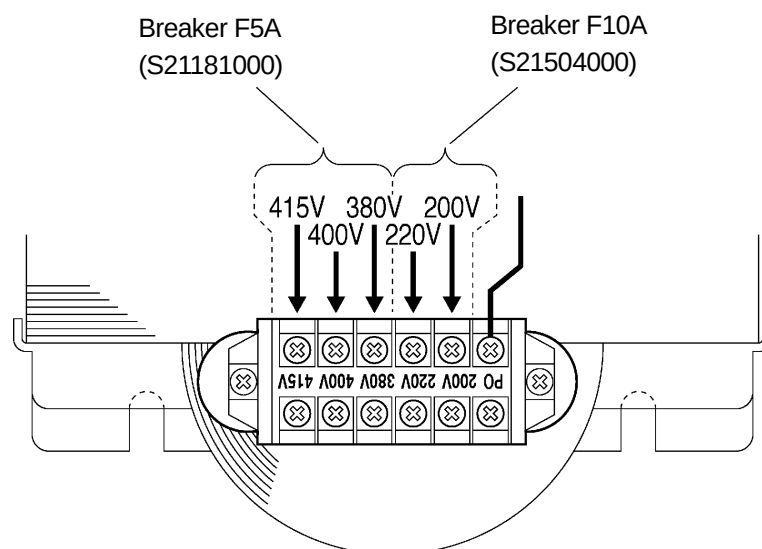
1768S

6. ELECTRIC COMPONENTS

6-3-4. Conversion of power supply voltage



1769S



1770S

6-4. PROM

Kind	Function	The place attached	Name
Main	Control of a sewing machine Read and write of data Programming	Main PCB	MN-*
Folding clamp	Control of a folding clamp Communication with a panel	Main PCB	FL-*
Operation panel	Control of a panel	Panel PCB	PL-*
Programmer	Control of a programmer	Programmer PCB	PG-*

* = version No. (A, B, ...)

The version of PROM can be checked also on an operation panel. Press a [TEST] switch when the power supply switch is turned ON.

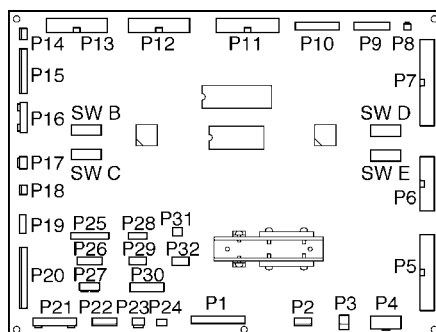
PROM	MN-E
Version	FL-C
	PL-M-C
	PG-F

Panel PROM

- PL-M - * : English / Spanish / French / Turkish
 PL-J - * : English / Japanese

6-5-1. Main PCB

The figure is a part code S51862 - PCB.



1771S

No.	Connection	No.	Connection
P1	Machine sensor	P17	Foot switch
P2	Stacker motor	P18	Start switch
P3	Thread trimmer solenoid	P19	Clamp-in sensor
P4	Power supply PCB	P20	Home position, over travel sensor
P5	Folding clamp valve	P21	2 row sensor
P6	Machine valve	P22	Jig pattern sensor
P7	Floppy disk drive (data)	P23	Work clamp cylinder sensor
P8	Floppy disk drive (power supply)	P24	Not use (For BAS - 370E series)
P9	Programmer	P25*	Expansion bus control signal output
P10	Operation panel	P26*	Main CPU expansion input
P11	Servo amplifier (machine)	P27*	Main CPU expansion output
P12	Servo amplifier (Y)	P28*	Folding clamp CPU expansion input
P13	Servo amplifier (X)	P29*	Folding clamp CPU expansion output
P14	Air switch	P30	Not use (For BAS - 370E series)
P15	Folding clamp cylinder sensor	P31*	Expansion solenoid output
P16	Switch box	P32*	Expansion pulse motor output

* As for the part code S46658 - PCB, connector No. differs as follows.

P25→P24, P26→P25, P27→P26, P28→P27, P29→P28, P31→P29, P32→P30

P1 [HEAD-SENS] (JAPAN SOLDERLESS TERMINAL B15B-XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+12V	“E - 520” appears without thread breakage.
2	Thread breakage input	
3	±0V	
4	+5V	“E - 550” appears. Machine does not stop in needle up position.
5	Needle up sensor input	
6		
7	+5V	Machine does not trim thread. Feed mechanism does not move. Timing of thread trimming is abnormal.
8	Synchronizing sensor input	
9		“E - 540” appears.
10	+5V	“E - 560” appears.
11	Presser foot sensor input	
12	±0V	
13	+5V	“E - 580” appears.
14	Zigzag sensor input	
15	±0V	

P2 [STACKER-MOTOR] (JAPAN SOLDERLESS TERMINAL B6P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Pulse motor output	Stacker roller does not rotate.
2		
3		
4		
5	+36V	
6		

P3 [TRIM] (MOLEX 5273-02A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	Defective thread trimming
2	Thread trimmer solenoid	

P4 [POWER] (MOLEX 5566-10A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	Power supply lamp of the operation panel does not light.
2	±0V	
3	+12V	Thread breakage sensor lamp does not light. Back light of the operation panel does not light.
4	±0V	
5	-12V	
6	+24V	Air valve does not operate. Over travel sensor lamp does not light.
7	±0V	
8	+36V	Stacker roller does not rotate.
9	±0V	
10		

6. ELECTRIC COMPONENTS

P5 [VALVE (FL)] (JAE PS-30PE-D4T1-LP1)

Pin No.	Signal name	Probable symptoms due to poor contact
A1	Folding clamp valve A output	Each cylinder of the folding clamp does not operate. "E-900", "E-901", "E-902" appears.
B1	Inner clamp valve A output	
A2	Center blade valve A output	
B2	Clamp valve A output	
A3	+24V	
B3	+24V	
A4	Folding clamp valve B output	
B4	Inner clamp valve B output	
A5	Center blade valve B output	
B5	Clamp valve B output	
A6	Folding base 10 valve output	Folding base does not operate. Label can not set. Suction (Vacuum) device does not operate. Slide plate elevator does not operate. "E-903" appears.
B6	Folding base 1.5 valve output	
A7	Label valve output	
B7	Suction (Vacuum) valve output	
A9	Slide plate elevator valve output	
A8	+24V	
B8	+24V	Tucking blade does not operate.
B9	Tucking blade 1 valve output	
A10	Tucking blade 2 valve output	
B10	Tucking blade 3 valve output	
A11	Tucking blade 4 valve output	
B11	Stacker wiper valve output	Cylinder of the stacker does not operate correctly.
A12	Stacker inside bar valve output	
B12	Stacker outside bar valve output	
A14	Stacker roller valve output	
A13	+24V	
B13	+24V	Not use
B14	Valve output (spare)	
A15	Valve output (spare)	
B15	Valve output (spare)	

P6 [VALVE (MN)] (JAE PS-16PE-D4T1-LP1)

Pin No.	Signal name	Probable symptoms due to poor contact
A1	Thread wiper valve output	Thread wiper does not operate. Needle cooler does not operate. Presser foot does not operate. Zigzag does not operate.
B1	Needle cooler output	
A2	Presser foot valve output	
B2	Zigzag valve output	
A3	+24V	
B3	+24V	Thread tension release does not operate. 2 step thread tension release does not operate.
A4	Thread tension release valve output	
B4	2 step thread tension release valve output	2 row changer does not operate.
A6	2 row changer 1 valve output	
B6	2 row changer 2 valve output	
A8	+24V	Not use
A5	Valve output (spare)	
B5	Valve output (spare)	
A7	Valve output (spare)	
B7	Valve output (spare)	
B8	+24V	

P7 [FDD] (3 M 3431-6002SCFL)

Pin No.	Signal name	Probable symptoms due to poor contact
1 - 34	FDD control signal	Floppy disk drive does not operate. Read and write of the floppy disk drive is abnormal. "E-700", "E-701" appears.

P8 [FDD-POWER] (MOLEX 5045-02A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	Floppy disk drive does not operate. Access lamp does not light. "E-700", "E-701" appears.
2	±0V	

P9 [PROGRAMMER] (JAPAN SOLDERLESS TERMINAL B10B-XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	±0V	Programmer does not operate. Switch does not operate. Indication of LCD is abnormal.
2		
3	Send data	
4	Send control	
5	Receive data	
6	Receive control	
7	+12V	
8	-12V	
9	+5V	
10		

6. ELECTRIC COMPONENTS

P10 [PANEL] (JAPAN SOLDERLESS TERMINAL B12B-XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	±0V	Power lamp of the operation panel does not light. Back light of the operation panel does not light. Operation panel does not operate. Switch does not operate. Indication of LCD is abnormal.
2		
3	Receive data	
4	Receive control	
5	Send data	
6	Send control	
7	Error lamp	
8	+12V	
9		
10	-12V	
11	+5V	
12		

P11 [Z-SRV] (JAE PS-20PE-D4T1-LP1)

Pin No.	Signal name	Probable symptoms due to poor contact
A1-A10 B1-B10	Servo amplifier control signal (machine motor)	Machine motor does not rotate. "E-890" appears.

P12 [Y-SRV] (JAE PS-20PE-D4T1-LP1)

Pin No.	Signal name	Probable symptoms due to poor contact
A1-A10 B1-B10	Servo amplifier control signal (Y feed motor)	Y feed motor does not rotate. "E-880" appears.

P13 [X-SRV] (JAE PS-20PE-D4T1-LP1)

Pin No.	Signal name	Probable symptoms due to poor contact
A1-A10 B1-B10	Servo amplifier control signal (X feed motor)	X feed motor does not rotate. "E-870" appears.

P14 [AIRSW] (JAPAN SOLDERLESS TERMINAL B3P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	(+5V)	"E-820, E-821" appears.
2	Air pressure sensor input	
3	±0V	

P15 [FL-SENS] (JAPAN SOLDERLESS TERMINAL B12P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	"E-900" appears.
2	Folding clamp sensor input	
3	±0V	
4	+5V	"E-901" appears.
5	Inner clamp sensor input	
6	±0V	
7	+5V	"E-902" appears.
8	Center blade sensor input	
9	±0V	
10	+5V	"E-903" appears.
11	Folding base sensor input	
12	±0V	

P16 [EM/START] (MOLEX 5045-09A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	EMERGENCY STOP switch NC	"E-810" appears.
2	±0V	
3	EMERGENCY STOP switch NO	
4	RESET switch	Reset of an error cannot be performed.
5	±0V	
6	Re-start switch	Re-start switch does not operate.
7	±0V	
8	FOLDER RESET switch	FOLDER RESET switch does not operate.
9	±0V	

P17 [FOOT-SW] (MOLEX 5045-04A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Foot switch 1	Suction (Vacuum) device does not operate.
2	±0V	
3	(Foot switch 2)	
4	(±0V)	

P18 [START-SW] (JAPAN SOLDERLESS TERMINAL B4P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Start switch 1	Folding clamp does not operate.
2	±0V	
3	Start switch 2	
4	±0V	

6. ELECTRIC COMPONENTS

P19 [CLAMP-IN] (JAPAN SOLDERLESS TERMINAL B6B-PH-K-S)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	Center blade does not operate. Folding clamp does not operate. “E-960” appears.
2	CLAMP-IN sensor 1	
3	±0V	
4	+24V	
5	CLAMP-IN sensor 2	
6	±0V	

P20 [ORG/OVR] (JAPAN SOLDERLESS TERMINAL B18P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	“E-830” appears.
2	+X over-travel input	
3	±0V	
4	+24V	“E-840” appears.
5	-X over-travel input	
6	±0V	
7	+24V	“E-850” appears.
8	+Y over-travel input	
9	±0V	
10	+24V	“E-860” appears.
11	-Y over-travel input	
12	±0V	
13	+24V	“E-910” appears.
14	X home position input	
15	±0V	
16	+24V	“E-920” appears.
17	Y home position input	
18	±0V	

P21 [2ROW-SENS] (MOLEX 5045-13A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	Not use
2	+24V	“E-570” appears.
3	2 row sensor input 1	
4	±0V	
5	+24V	
6	2 row sensor input 2	
7	±0V	
8	+24V	
9	2 row sensor input 3	
10	±0V	
11	+24V	
12	2 row sensor input 4	
13	±0V	

P22 [JIG-PATTERN] (JAPAN SOLDERLESS TERMINAL B8P-SHF-1AA)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+12V	"E-530", "E-535", "E-536" appears.
2	Pattern sensor input 1	
3	Pattern sensor input 2	
4	Pattern sensor input 3	
5	Pattern sensor input 4	
6	Pattern sensor input 5	
7	Pattern sensor input 6	
8	±0V	

P23 [CLAMP] (MOLEX 5045-03A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	"E-970" appears.
2	Clamp sensor input	
3	±0V	

P24 [ZIGSET] (JAPAN SOLDERLESS TERMINAL B3B-PH-K-S)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	Not use (It cannot be used by BAS - 761, 7610.)
2	NC	
3	±0V	

P25 (P24) [EXT] (JAPAN SOLDERLESS TERMINAL B26B-PHDSS)

Pin No.	Signal name	Probable symptoms due to poor contact
1 - 26	Expansion bus control signal output	Not use (It does not use by BAS-761, 7610.)

6. ELECTRIC COMPONENTS

P26 (P25) [MN-OP-IN] (JAPAN SOLDERLESS TERMINAL B16B-PHDSS)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	For automatic bobbin changer (option).
2	+24V	
3	Expansion sensor input 1	
4	±0V	
5	+5V	
6	+24V	
7	Expansion sensor input 2	
8	±0V	
9	+5V	
10	+24V	
11	Expansion sensor input 3	
12	±0V	
13	+5V	
14	+24V	
15	Expansion sensor input 4	
16	±0V	

P27 (P26) [MN-OPT-OUT] (MOLEX 5045-06A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Expansion valve output 1	For automatic bobbin changer (option).
2	Expansion valve output 2	
3	Expansion valve output 3	
4	Expansion valve output 4	
5	+24V	
6	+24V	

P28 (P27) [FL-OPT-IN] (JAPAN SOLDERLESS TERMINAL B12B-PHDSS)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+5V	Not use (It does not use by BAS-761, 7610.)
2	+24V	
3	Expansion sensor input 5	
4	±0V	
5	+5V	
6	+24V	
7	Expansion sensor input 6	
8	±0V	
9	+5V	
10	+24V	
11	Expansion sensor input 7	
12	±0V	

P29 (P28) [FL-OPT-OUT] (MOLEX 5045-05A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Expansion valve output 5	Not use (It does not use by BAS - 761, 7610.)
2	Expansion valve output 6	
3	Expansion valve output 7	
4	Expansion valve output 8	
5	+24V	

P30 [PRESS] (JAPAN SOLDERLESS TERMINAL B9B-XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	Not use (It does not use by BAS-761, 7610.)
2	NC	
3	±0V	
4	+24V	
5	NC	
6	±0V	
7	+24V	
8	NC	
9	±0V	

P31 (P29) [MAGNET] (JAPAN SOLDERLESS TERMINAL B2B-XH-A)

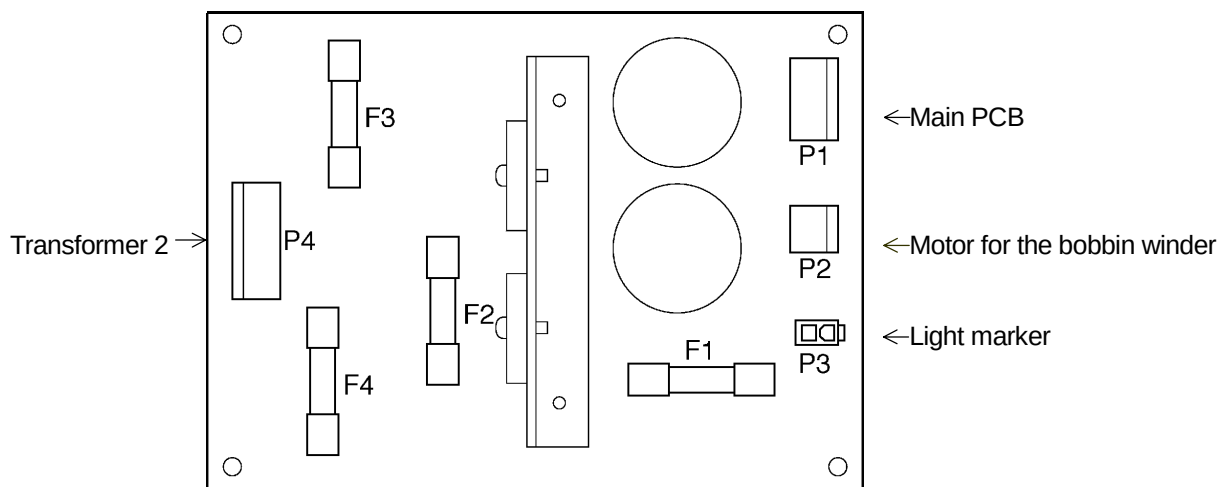
Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	Not use (It does not use by BAS-761, 7610.)
2	Expansion solenoid output	

P32 (P30) [EXPM] (JAPAN SOLDERLESS TERMINAL B4B- XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	Expansion pulse motor output	For automatic bobbin changer (option).
2		
3		
4		

6. ELECTRIC COMPONENTS

6-5-2. Power supply PCB



1772S

P1 [MAIN] (MOLEX 5277- 04A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	$\pm 0V$	The air valve does not operate. The over travel sensor lamp is not lit.
2	+24V	
3	$\pm 0V$	The stacker roller does not turn.
4	+36V	

P2 [THREAD MOTOR] (MOLEX 5277-02A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	The motor of the bobbin winder does not turn.
2	$\pm 0V$	

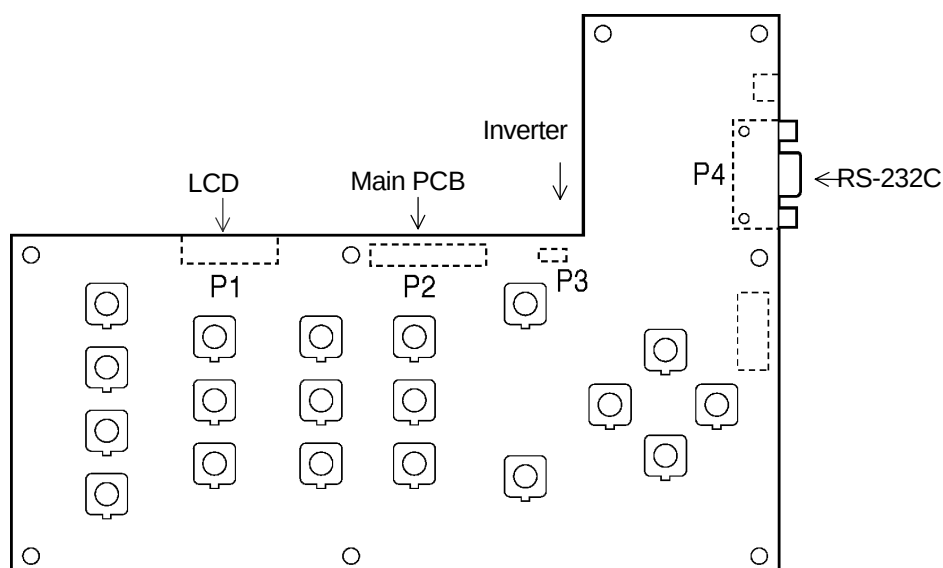
P3 [LIGHT MARKER] (MOLEX 5566-02A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	AC4.5V	The light marker is not lit.
2	AC4.5V	

P4 [AC-IN] (MOLEX 5277 - 06A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	AC26V	The stacker roller does not turn.
2	AC26V	
3	AC18V	The air valve does not operate. The motor of the bobbin winder does not turn. The over travel sensor lamp is not lit.
4	AC18V	
5	AC4.5V	
6	AC4.5V	The light marker is not lit.

6-5-3. Operation panel PCB



1773S

P1 [LCD] (JAPAN SOLDERLESS TERMINAL 19FE-ST)

Pin No.	Signal name	Probable symptoms due to poor contact
1 - 19	LCD control	LCD does not indicate.

P2 [MAIN] (JAPAN SOLDERLESS TERMINAL B12B-XH-A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	±0V	The power lamp of the operating panel is not lit. Back light of the operating panel is not lit. The operating panel does not operate. The switch of the operating panel does not operate. Indication of the operating panel is abnormal.
2		
3	Sending data	
4	Sending control	
5	Reception data	
6	Reception control	
7	Error lamp	
8	+12V	
9		
10	-12V	
11	+5V	
12		

P3 [INVERTER] (JAPAN SOLDERLESS TERMINAL B2B-EH)

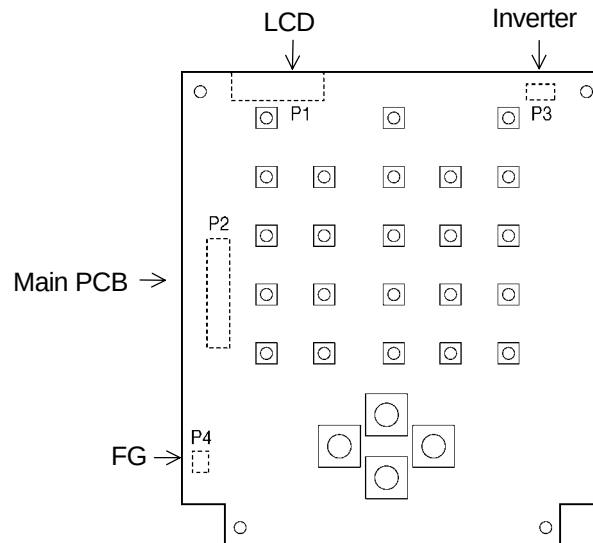
Pin No.	Signal name	Probable symptoms due to poor contact
1	±0V	Back light of the LCD is not lit.
2	+12V	

6. ELECTRIC COMPONENTS

P4 [RS-232C] (FUJITSU FCN-675J009-L/C#QD)

Pin No.	Signal name	Probable symptoms due to poor contact
1	DCD	Not use
2	TXD	
3	RXD	
4	DSR	
5	SG	
6	DTR	
7	CTS	
8	RTS	
9	R1	

6-5-4. Programmer PCB



1774S

P1 [LCD] (JAPAN SOLDERLESS TERMINAL 19FE-ST)

Pin No.	Signal name	Probable symptoms due to poor contact
1-19	LCD control	LCD does not indicate.

P2 [MAIN] (MOLEX 5268-12A)

Pin No.	Signal name	Probable symptoms due to poor contact
1	±0V	The programmer does not operate. The switch of the programmer does not operate. Indication of the programmer is abnormal. Back light of the LCD does not lit.
2		
3	Reception data	
4	Reception control	
5	Sending data	
6	Sending control	
7	+11V	
8	-11V	
9	+5V	
10	+5V	
11	CTS	
12	RTS	

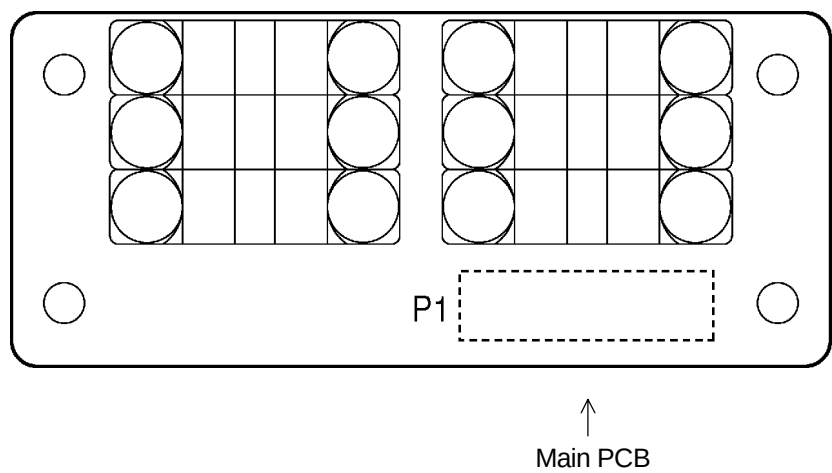
P3 [INVERTER] (JAPAN SOLDERLESS TERMINAL B3B-PH)

Pin No.	Signal name	Probable symptoms due to poor contact
1	CFL ON / OFF	Back light of the LCD is not lit.
2	±0V	
3	+12V	

P4 [FG] (JAPAN SOLDERLESS TERMINAL B2B-PH)

Pin No.	Signal name	Probable symptoms due to poor contact
1	FG	It may incorrect-operate by the noise.
2	FG	

6-5-5. Pattern sensor PCB



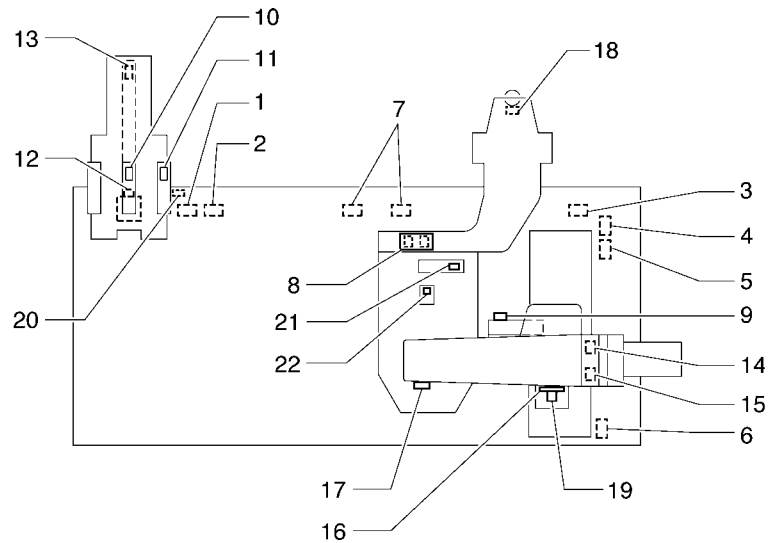
1775S

P1 [MAIN] (JAPAN SOLDERLESS TERMINAL B8B-XH-A)

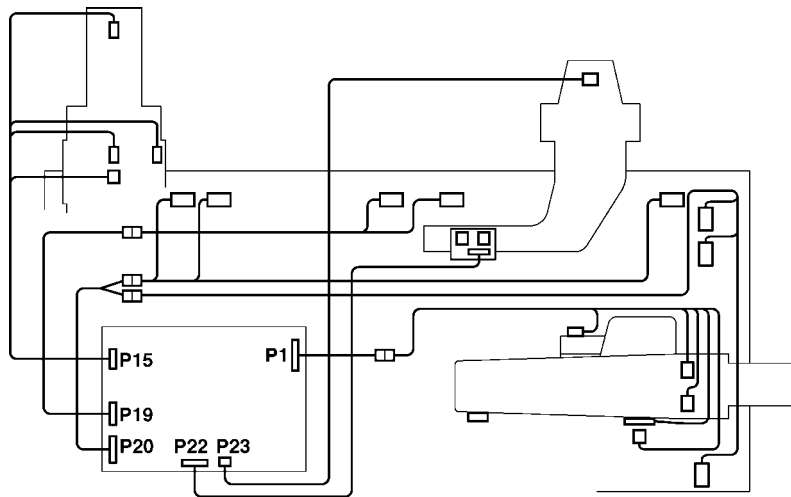
Pin No.	Signal name	Probable symptoms due to poor contact
1	+24V	"E-530", "E-535", "E-536" appears.
2	Pattern sensor input 1	
3	Pattern sensor input 2	
4	Pattern sensor input 3	
5	Pattern sensor input 4	
6	Pattern sensor input 5	
7	Pattern sensor input 6	
8	±0V	

6-6. Sensor

6-6-1. Sensor location



1776S



1777S

No.	Sensor name	Type	No.	Sensor name	Type
1	Over travel sensor (-X)	A	12	Cylinder sensor (folding base)	C
2	X home position sensor	A	13	Cylinder sensor (center blade)	C
3	Over travel sensor (+X)	A	14	Machine sensor (needle up)	B
4	Over travel sensor (+Y)	A	15	Machine sensor (synchronizing)	B
5	Y home position sensor	A	16	Amplifier unit (needle thread breakage detector)	D
6	Over travel sensor (-Y)	A	17	Fiber unit (needle thread breakage detector)	D
7	Clamp in	A	18	Cylinder sensor (clamp)	C
8	Jig pattern sensor	B	19	Cylinder sensor (zigzag)	C
9	Cylinder sensor (presser foot)	C	20	Air pressure sensor (switch)	-
10	Cylinder sensor (inner clamp)	C	21	2 row sensor (side)	C
11	Cylinder sensor (folding clamp)	C	22	2 row sensor (bottom)	C

Type – A : Proximity sensor

Type – B : Optical sensor (slit)

Type – C : Cylinder sensor (proximity)

Type – D : Optical sensor (reflect)

6. ELECTRIC COMPONENTS

6-6-2. Function of sensor

< Home position sensor (X, Y) >

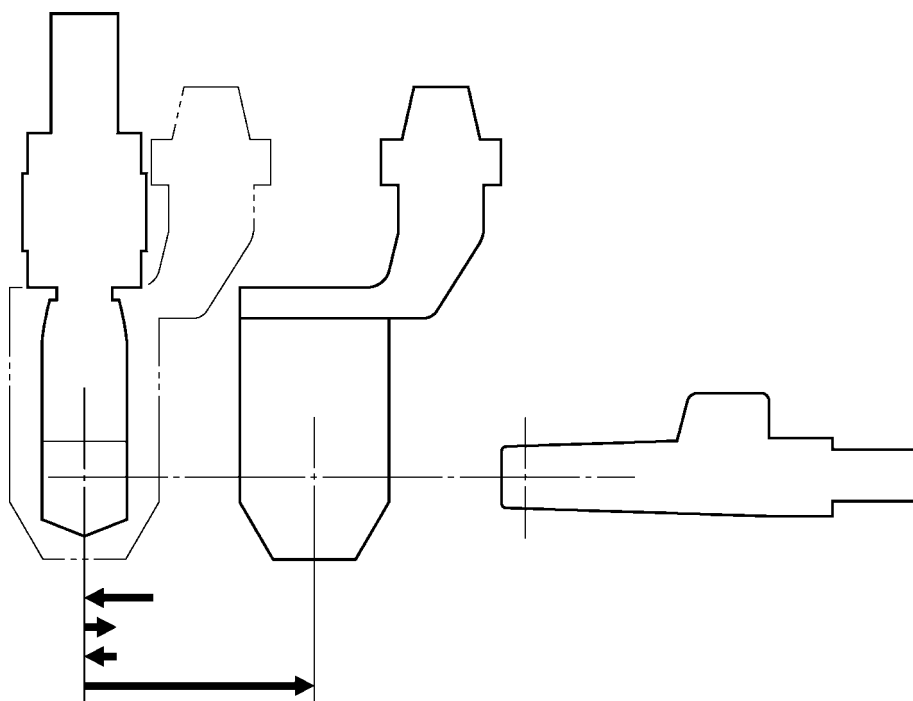
Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
X (2)	P20	13	+24V	Sewing clamp is in home position.	E-840
		14	X home position		
		15	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Y (5)	P20	16	+24V	Machine head is in home position.	E-830
		17	Y home position		
		18	±0V		

This sensor is for home positioning of the clamp (X directions) and the machine head (the direction of Y).

When the home position sensor does not work but a machine overruns, the over travel sensors detects overrun.

Refer to <Adjusting the location of X (Y) home position sensor> in “5-25. Checking and adjusting the home position”, when you adjust the position of the sensor.



1778S

Movement of the sewing clamp and the machine (detect the home position)

1. The sewing clamp moves to the left along the X-axis, the sewing machine moves upward along the Y-axis. The sewing clamp and the sewing machine stop where the home position sensors of both axes are turned ON.
 2. The sewing clamp and the sewing machine move backward for about 15 mm from the stop positions. Then they move again at low speed until the home position sensors are turned ON.
 3. After the home position is located, the sewing machine does not move, and the sewing clamp moves to the standby position (450 mm to the right) and stops.
 4. When the folding machine is in the manual mode (MAN), and the sewing clamp moves to the folding machine and then clamps the center blade, the centers of the center blade and the sewing clamp should be aligned.
- * When the power is turned on and the error code “E-510” appears, reset and move the needle bar its highest position.
 - * The error codes “E-830”, “E-840”, “E-850” and “E-860” appears, the folding clamp and the inner clamp of the folding machine are not completely raised or the cylinder sensor does not operate. Check the sensors’ operation.

< Over travel sensor (X+, X-, Y+, Y-) >

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
X + (3)	P20	1	+24V	Sewing clamp is in normal position.	E-830
		2	X over travel right		
		3	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
X - (1)	P20	4	+24V	Sewing clamp is in normal position.	E-840
		5	X over travel left		
		6	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Y + (4)	P20	7	+24V	Machine head is in normal position.	E-850
		8	Y over travel up		
		9	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Y - (6)	P20	10	+24V	Machine head is in normal position.	E-860
		11	Y over travel down		
		12	±0V		

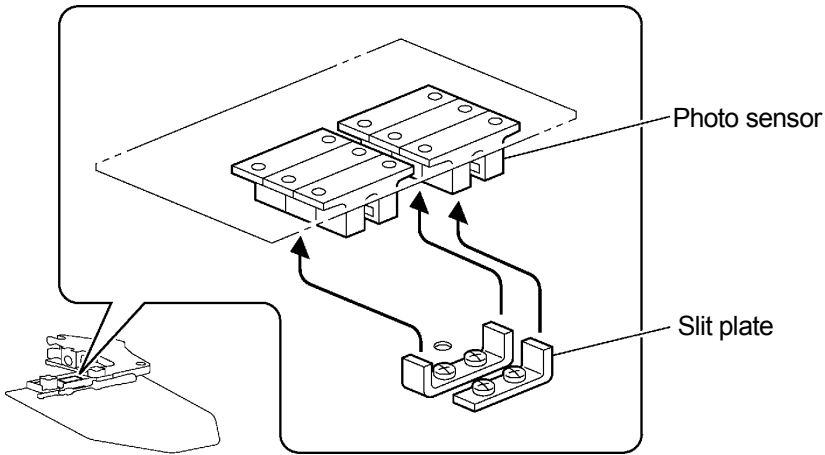
1. The over travel sensor controls the movable area of the X-axis and the Y-axis.
2. The feed overruns while feeding and the sensor turns ON (LED turns OFF). The servo amplifier turns OFF automatically and the motor stops.
3. If breakage occurs at the over travel sensors, or if the connectors are not connected properly, the fail safe function displays an alarm, such as "E-830", "E-840", "E-850" or "E-860" even if the feed does not overrun.
Refer to <Adjusting the location of X (Y) home position sensor> in "5-25. Checking and adjusting the home position", when you adjust the position of the sensor.

6. ELECTRIC COMPONENTS

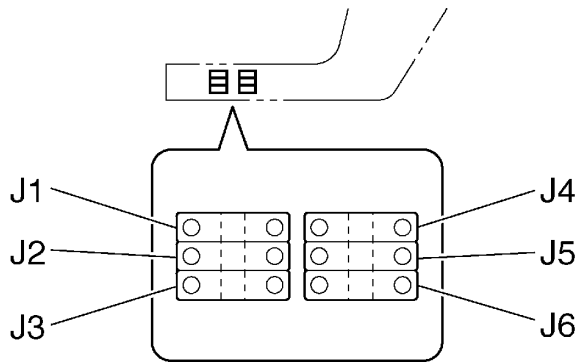
< Jig pattern sensor >

Sensor	Connector	Pin No.	Signal name
Jig pattern (8)	P22	1	+ 12V
		2	Pattern 1 (Weight X4)
		3	Pattern 2 (Weight X2)
		4	Pattern 3 (Weight X1)
		5	Pattern 4 (Weight X32)
		6	Pattern 5 (Weight X16)
		7	Pattern 6 (Weight X8)
		8	±0V

- 1. The jig pattern sensor checks if the number of the program read from the floppy disk and the number of the sewing clamp set to the machine are identical.
- 2. The jig pattern sensor consists of six photo sensors. This sensor checks 64 jig patterns by combining the slit plates on the sewing clamp.
- 3. When DIP switch B-1 on the main PCB is set to on, the machine can sew regardless of the signal of the jig pattern sensor. (Set the DIP switch to off in usual operation. It is set off for shipping.)

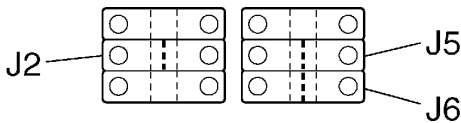


1779S



1780S

Sensor No.	Weight of the code
J1	32
J2	16
J3	8
J4	4
J5	2
J6	1



Example
16 + 2 + 1 = 19

1781S

< Cylinder sensor >

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Folding clamp (11)	P15	1	+5V	Folding clamp is in an upper position.	E-900
		2	Folding clamp		
		3	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Inner clamp (10)	P15	4	+5V	Inner clamp is in an upper position.	E-901
		5	Inner clamp		
		6	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Center blade (13)	P15	7	+5V	Inner clamp is in an back position.	E-902
		8	Center blade		
		9	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Folding base (12)	P15	10	+5V	Folding base is in an upper position.	E-903
		11	Folding base		
		12	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Work clamp (18)	P23	1	+5V	Work clamp is in an upper position.	E-970
		2	Work clamp		
		3	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
2 row (21) (22)	P21	1	+5V	Upper sewing clamp is in the position which sews an inner side.	E-570
		2	---		
		3	2 row exchange (bottom)		
		4	±0V		
		5	+24V		
		6	2 row exchange (side)		
		7	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Pressure foot (9)	P1	10	+5V	Pressure foot is in an upper position.	E-560
		11	Pressure foot		
		12	±0V		

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Zigzag (19)	P1	13	+5V	Zigzag is not carried out.	E-580
		14	Zigzag		
		15	±0V		

The cylinder sensor detects the positions of the each cylinder rod.

If cylinder sensors (10), (11) are not turned ON within a certain time when the power is turned on and when the folding machine is reset, the control software decides to display an error “E-900”, “E-901”, “E-902” or “E-903”.

If cylinder sensor (13) is not turned ON while the center blade receding, the home position is not located. And after folding has been completed and the center blade recedes, the sewing clamp does not move to the sewing machine.

If cylinder sensor (9) of the presser foot is not turned ON when the presser foot ascends, the home position is not located. And the sewing clamp does not move to the sewing machine to sew as described in above. An error code, “E-560” will be displayed at this time.

Refer to “5-27. Adjusting the cylinder sensors”, when you adjust the position of the sensor.

6. ELECTRIC COMPONENTS

< Sewing machine sensor >

Needle up sensor

Sensor	Connector	Pin No.	Signal name	The error No. at fault
Needle up (14)	P1	4	+5V	E-510 – 513, E-550
		5	Needle up	
		6	K	

The needle up sensor sends a signal when the needle bar approaches its highest position.

This signal stops the needle at its up position.

When sewing is completed or when the sensor does not operate, the error code “E-550” will be displayed, and the machine will stop.

Synchronizing sensor

Sensor	Connector	Pin No.	Signal name	The error No. at fault
Synchronizing (15)	P1	7	+5V	E-540
		8	Synchronizing	
		9	K	

The synchronizing sensor sends a synchronizing signal for the machine motor and the feeder.

This signal decides the timing of operating the thread trimmer solenoid.

When the sensor does not operate, the error code “E-540” will be displayed, and the machine will stop.

Needle thread breakage detector

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Needle thread breakage detector (16) (17)	P1	1	+24V	Thread is on center line at the tip of a fiber.	E-520
		2	Needle thread breakage		
		3	±0V		

The needle thread breakage detector consists of the fiber unit and the amplifier unit.

The detector sends the signal when the needle thread breaks.

This signal displays an error “E-520” and stops the machine.

The needle thread breakage function can be ignored by controlling the needle thread monitor switch.

< Clamp-in sensor >

Sensor	Connector	Pin No.	Signal name	State in case sensor LED is ON	The error No. at fault
Clamp-in (7)	P19	1	+24V	Work clamp is in an stand-by position.	E-960
		2	Clamp-in 1		
		3	±0V		
		4	+24V		
		5	Clamp-in 2		
		6	±0V		

The two clamp-in sensors will be detected that the folding clamp is on standby (under the condition that positioning is completed).

When the clamp-in sensor detect that positioning is not completed, the center blade does not move forward.

The folding clamp move to sewing machine, but the center blade does not move forward, the two clamp-in sensors will check the clamp motion to move it to the standby position, and their LEDs will light.

< Air pressure sensor (switch) >

Sensor	Connector	Pin No.	Signal name		The error No. at fault
Air pressure (20)	P14	2	Air pressure		E-820
		3	$\pm 0V$		

6-7. Harness

Refer to "6-12. Control circuit block diagram" together.

6-7-1. Harness connecting table

Harness		Connection		Symptom of poor contact or disconnect
1	Power supply harness A	Outlet	Breaker	A sewing machine is not turned on. (A operating panel does not display. LED of servo amplifier does not display. A light marker does not light up.)
2	Breaker NF1 harness	Breaker	Noise filter PCB	
3	NF1-T1 harness	Noise filter PCB	Transformer 1	A operating panel does not display. A light marker does not light up.
4	T1-T2 harness	Transformer 1	Transformer 2 Switching power supply CN1	
5	T2-P PCB harness	Transformer 2	Power supply PCB P4	A light marker does not light up. Solenoid valve does not operate. Pulse motor for stacker roller does not rotate.
6	T1-NF2 harness	Transformer 1	Noise filter	LED of servo amplifier does not display.
7	Main power supply harness	Switching power supply CN2 Power supply PCB P1	Main PCB P4	A operating panel does not display.
8	Servo power harness X	Noise filter	X axis servo amplifier	X axis servo amplifier does not display. Power ON --- "E-870"
9	Servo power harness Y	Noise filter	Y axis servo amplifier	Y axis servo amplifier does not display. Power ON --- "E-880"
10	Servo power harness Z	Noise filter	Z axis servo amplifier	Z (machine) axis servo amplifier does not display. Power ON --- "E-890"
11	Bobbin winder harness	Power supply PCB P2	Bobbin winding motor	Bobbin winding motor does not rotate.
12	Maker harness	Power supply PCB P3	Light marker	Light marker does not light.
13	T1 protector harness	Transformer 1	Circuit protector	Motor for vacuum does not rotate.
14	Protector motor harness	Circuit protector	Blower motor	
15	Motor power harness X	X axis servo amplifier UVW	X axis servo motor	Sewing clamp does not operate. Panel --- "E-870" Servo AMP. --- "AL.52"
16	Motor power harness Y	Y axis servo amplifier UVW	Y axis servo motor	Machine head does not move. Panel --- "E-880" Servo AMP. --- "AL.52"
17	Motor power harness Z	Z axis servo amplifier UVW	Z axis servo motor	Machine motor does not rotate. Panel --- "E-870" Servo AMP. --- "AL.52"
18	Encoder harness X	X axis servo amplifier CN2	X axis servo motor	Sewing clamp does not operate. Panel --- "E-870" Servo AMP. --- "AL.16"
19	Encoder harness Y	Y axis servo amplifier CN2	Y axis servo motor	Machine head does not move. Panel --- "E-880" Servo AMP. --- "AL.16"
20	Encoder harness Z	Z axis servo amplifier CN2	Z axis servo motor	Machine motor does not rotate. Panel --- "E-890" Servo AMP. --- "AL.16"
21	Servo harness X	Main PCB P13	X axis servo amplifier CN1A, 1B	Sewing clamp does not operate. Panel --- "E-870" Servo AMP. --- "AL.E6"
22	Servo harness Y	Main PCB P12	Y axis servo amplifier CN1A, 1B	Machine head does not move. Panel --- "E-880" Servo AMP. --- "AL.E6"
23	Servo harness Z	Main PCB P11	Z axis servo amplifier CN1A, 1B	Machine motor does not rotate. Panel --- "E-890" Servo AMP. --- "AL.E6"
24	FDD power harness	Main PCB P8	Floppy disk drive	A floppy disk cannot be accessed. Panel --- "E-700", "E-701"

25	FDD harness	Main PCB P7	Floppy disk drive	A floppy disk cannot be accessed. Panel --- "E-700", "E-701"
26	Air switch harness	Main PCB P14	Air switch	Panel --- "E820"
27	Foot switch harness	Main PCB P17	Foot switch	Folding clamp does not operate.
28	Panel harness	Main PCB P10	Panel PCB P2	LCD, LED of operation panel does not indicate. LCD back light does not light.
29	Panel inverter harness	Panel PCB P2	Inverter PCB CN1	LCD back light does not light.
30	Programmer harness	Main PCB P9	Programmer	It cannot switch to program mode.
31	Switch box harness	Main PCB P16	Switch box	FOLDER RESET / START / REST switch does not operate. Panel --- E-810
32	Hand switch harness	Main PCB P18	Hand switch	Folding clamp does not operate (Folding clamp auto mode).
33	Machine sensor harness A	Main PCB P1	Synchronizing / Needle up / presser foot / Needle thread breakage detector	When XY feed operate --- "E-510 - 513" When presser foot operate --- "E-560" When sewing --- "540" Needle thread breakage Incorrect detection
	Machine sensor harness B			
34	Thread trimmer harness	Main PCB P3	Thread trimmer solenoid	Thread trimmer solenoid does not operate.
35	Sewing clamp harness	Main PCB P23	Sewing cylinder sensor	Panel --- "E-970"
	Sewing clamp cylinder harness			
36	Jig pattern harness	Main PCB P22	Jig pattern PCB	The pattern of a clamp cannot be recognized. (It is always recognized as No. 63.)
37	2 row sensor harness A 2 row sensor harness B Sensor D-H7A1 assy Sensor D-A96 assy	Main PCB P21	2 row switching sensor	When sewing --- "E-570"
38	Folding clamp sensor	Main PCB P15	Folding clamp sensor	When folding clamp operate --- "E-900 - 903"
39	Main valve harness	Main PCB P6	Valve 14, 15, 23 - 28	Cylinder does not operate.
40	Folding clamp valve harness	Main PCB P5	Valve 1- 13, 19 - 22	Cylinder does not operate.
41	Area sensor harness	Main PCB P20	XY feed sensor	When power ON --- "E-830", "E-840", "E-850", "E-860" When detecting home position --- "E-840", "E-850", "E-910", "E-920"
	Area sensor X			
	Area sensor Y			
42	Clamp-in harness	Main PCB P19	Clamp in sensor	When X feeding --- "E-960"
	Clamp-in sensor			

6. ELECTRIC COMPONENTS

6-7-2. Harness connecting pin number table

1. Power supply harness A (S23868)

Terminal side	Breaker side	Voltage (AC)
Black	Black	200V, 220V, 380V, 400V, 415V
White	White	
Red	-	
Green/yellow	Green/yellow	E (Ground)

2. Breaker-NF1 harness (S46608)

Breaker side	Noise filter	Voltage (AC)
Black	Black	200V, 220V, 380V, 400V, 415V
White	White	

3. NF1-T1 harness (S46707)

Noise filter (For Transformer 1)	Transformer 1	Voltage (AC)
1	P0	P0V
3	Primary voltage	200V, 220V, 380V, 400V, 415V

4. T1-T2 harness (S46605)

Transformer 1	Transformer 2	Switching power supply CN1	Voltage (AC)
6	6	-	100V
5	5	-	
7	-	3	120V
4	-	5	

5. T2-P PCB harness (S46607)

Transformer 2	Power supply PCB P4	Voltage (AC)
12	1	26V
11	2	
14	3	18V
13	4	
16	5	4.5V
15	6	

6. T1-NF2 harness (S46609)

Transformer 1	Noise filter	Voltage (AC)
1	IN	220V
8	IN	

7. Main power supply harness (S46612)

Switching power supply CN2	Power supply PCB P1	Power supply PCB P4	Signal/Voltage (DC)
5	-	1	+5V
7	-	2	±0V
1	-	3	+12V
2	-	4	±0V
3	-	5	-12V
-	2	6	+24V
-	1	7	±0V
-	4	8	+36V
-	3	9	±0V

8. Servo power supply harness X (S46622)

Noise filter	X axis servo amplifier	Voltage (AC)
OUT	L1, L11	220V
OUT	L2, L21	

9. Servo power supply harness Y (S46623)

Noise filter	Y axis servo amplifier	Voltage (AC)
OUT	L1, L11	220V
OUT	L2, L21	

10. Servo power supply harness Z (S46624)

Noise filter	Z axis (machine) servo amplifier	Voltage (AC)
OUT	L1, L11	220V
OUT	L2, L21	

11. Bobbin winder harness (S46592)

Power supply PCB P2	Bobbin winder-motor	Voltage (DC)
1	1	+24V
2	2	±0V

12. Maker harness (S46680)

Power supply PCB P3	Light marker	Voltage (AC)
1	1 (x3)	4.5V
2	2 (x3)	

13. T1-Protector harness (S46638)

14. Protector-motor harness (S46639)

T1-Protector harness		Protector-motor harness		Blower motor	Voltage (AC)
Transformer 1	Circuit protector	Circuit protector	Relay		
1	IN	OUT	1	1	100V
2	IN	OUT	2	2	
-	-	-	3	3	-

6. ELECTRIC COMPONENTS

15.Motor power supply harness X (S46630)

16.Motor power supply harness Y (S46631)

17.Motor power supply harness Z (S46632)

Servo amplifier	Servo motor	Signal
U	1	U
V	2	V
W	3	W
E	4	E

18.Encoder harness X (S46633)

19.Encoder harness Y (S46634)

20.Encoder harness Z (S46635)

Servo amplifier CN2	Servo motor	Signal
19, 20	7	P5
11, 12	8	LG
7	1	MR
17	2	MR R
6	4	MD
16	5	MD R
9	3	BT
1	8	LG
Plate	9	Shield

21.Servo harness X (S46625)

22.Servo harness Y (S46626)

Main PCB P13, 12	Servo amplifier		Signal
	CN1A	CN1B	
A2	8	-	CR
A10	10	-	SG
B4	19	-	RD
B5	18	-	INP
A6	13	-	PG
B6	3	-	PP
A7	12	-	NG
B7	2	-	NP
A9	6	-	LA
B9	16	-	LAR
A8	7	-	LB
B8	17	-	LBR
-	Plate	-	Shield
B1	-	16	LSP
B2	-	15	EMG
B3	-	14	RES
A4	-	17	LSN
A5	-	1	ALM
B10	-	20	SG
A3	-	5	SON
-	-	19	ZSP
-	CN1B 3 and 13 Connect →	3	-
-		13	-
-	-	Plate	Shield

23.Servo harness Z (S46627)

Main PCB P11	Servo amplifier		Signal
	CN1A	CN1B	
A2	8	-	CR
A10	1	-	LG
B4	19	-	RD
B5	18	-	INP
A6	13	-	PG
B6	3	-	PP
A7	12	-	NG
B7	2	-	NP
A9	6	-	LA
B9	16	-	LAR
A8	7	-	LB
B8	17	-	LBR
-	Plate	-	Shield
B1	-	1	LG
B2	-	15	EMG
B3	-	14	RES
A4	-	10	SG
A5	-	18	ALM
B10	-	20	SG
A3	-	5	SON
-	-	19	ZSP
-	CN1B 3 and 13 Connect →	3	-
-		13	-
-		Plate	Shield

24.FDD power supply harness (S46641)

Main PCB P8	FDD	Voltage (DC)
1	1	+5V
2	2	±0V
3	-	-
4	-	-

25.FDD harness (S46708)

Main PCB P7	FDD
1	1
2	2
⋮	⋮
⋮	⋮
33	33
34	34

26.Air switch harness (S46655)

Main PCB P14	Air switch	Voltage (DC)
1	-	-
2	1	AIR
3	2	±0V

6. ELECTRIC COMPONENTS

27. Foot switch harness (S46653), Foot switch plate L1 assy (S46265)

Foot switch harness		Foot switch plate L1 assy		Signal	
Main PCB P17	Relay	Relay	Foot switch		
1	1	-	-	-	
2	2	-		-	
3	-	-		-	
4	-	-	-	-	
5	-	-		-	
6	-	-		-	
7	7	7	Switch	N.O	FOOT SW
8	8	8		COM	±0V
9	-	-	-	-	

28. Panel harness (S46693)

Main PCB P10	Panel PCB P2	Signal/ Voltage (DC)
1	1	±0V
2	2	±0V
3	3	RXD
4	4	DSR
5	5	TXD
6	6	DTR
7	7	EMLED
8	8	+12V
9	9	+12V
10	10	-12V
11	11	+5V
12	12	+5V

29. Panel inverter harness (S40455)

Panel PCB P2	Inverter PCB CN1	Voltage (DC)
1	1	±0V
2	2	+12V

30. Programmer harness (S46642)

Main PCB P9	Programmer relay	Signal/ Voltage (DC)
1	1	±0V
2	2	±0V
3	3	TXD
4	4	DTR
5	5	RXD
6	6	DSR
7	7	+12V
8	8	-12V
9	9	+5V
10	10	+5V
-	11	-
-	12	-
-	13	-

31.Switch box harness (S46699)

Main PCB P16	Switch	Signal
1	EMERGENCY STOP	N.C
2		COM (X2)
3		N.O
4	RESET	N.O
5		COM
6	START	N.O
7		COM
8	FOLDER RESET	N.O
9		COM
-	-	Shield

32.Hand switch harness (S46654)

Main PCB P18	Switch	Signal
6	Left switch (x2)	N.O (X2)
7		COM (X2)
8	Right switch (x2)	N.O (X2)
9		COM (X2)

33.Machine sensor harness A (S46644)

Machine sensor harness B (S46645)

Machine sensor harness A		Machine sensor harness B						Signal/ Voltage (DC)
Main PCB P1	Relay	Relay	Thread breakage	Needle up	Synchronizing	Presser foot	Zigzag	
1	1	1	1	-	-	-	-	+24V
2	2	2	2	-	-	-	-	THBRK
3	3	3	3	-	-	-	-	±0V
4	4	4	-	3	-	-	-	+5V
5	5	5	-	1	-	-	-	NUP
6	6	6	-	2	-	-	-	K
7	7	7	-	-	3	-	-	+5V
8	8	8	-	-	1	-	-	SYNC
9	9	9	-	-	2	-	-	K
10	10	10	-	-	-	(Brown)	-	+5V
11	11	11	-	-	-	(Black)	-	FOOT
12	12	12	-	-	-	(Blue)	-	±0V
13	13	13	-	-	-	-	(Brown)	+5V
14	14	14	-	-	-	-	(Black)	ZIGZAG
15	15	15	-	-	-	-	(Blue)	±0V

34.Thread trimmer harness (S46593)

Main PCB P1	Thread trimmer solenoid	Signal/ Voltage (DC)
1	1	+24V
2	2	THCUT

35.Work clamp cylinder harness (S46584)

Main PCB P23	Sensor	Signal/ Voltage (DC)
1	(Brown)	+5V
2	(Black)	CLAMP
3	(Blue)	±0V

6. ELECTRIC COMPONENTS

36.Jig pattern harness (S46588)

Main PCB P22	Pattern PCB	Signal
1	1	+12V
2	2	JP1
3	3	JP2
4	4	JP3
5	5	JP4
6	6	JP5
7	7	JP5
8	8	±0V

37.2-row sensor harness A (S46589)

2-row sensor harness B (S46702)

Sensor D-A96 assy (S38181)

Sensor D-7A1 assy (S38182)

2-row sensor harness A		2-row sensor harness B		2-row sensor		
Main PCB P1	Relay	Relay	Relay	D-A96	D-7A1	Signal/ Voltage (DC)
1	1	1	1	1	-	+5V
2	2	2	2	-	-	+24V
3	3	3	3	2	-	BOTTOM
4	4	4	4	3	-	±0V
5	5	5	5	-	1	+24V
6	6	6	6	-	2	SIDE
7	7	7	7	-	3	±0V

38.Folding clamp sensor (S46591)

Main PCB P15	Sensor		Signal/ Voltage (DC)
1	Folding clamp	(Brown)	+5V
2		(Black)	OUT-CLAMP
3		(Blue)	±0V
4	Inner clamp	(Brown)	+5V
5		(Black)	IN-CLAMP
6		(Blue)	±0V
7	Center blade	(Brown)	+5V
8		(Black)	C-BLADE
9		(Blue)	±0V
10	Folding base	(Brown)	+5V
11		(Black)	FLD-BASE
12		(Blue)	±0V

39.Main valve harness (S46656)

Main PCB P6	SMC		Signal/ Voltage (DC)
A1	23	A	Thread wiper
A3		C	+24V
B1	24	A	Needle cooler
A3		C	+24V
A2	25	A	Presser foot
A3		C	+24V
B2	26	A	Zigzag
A3		C	+24V
A4	27	A	Thread tension release
B3		C	+24V
B4	28	A	2 step thread tension release
B3		C	+24V
A6	14	A	2-row changer 1
A8		C	+24V
B6	15	A	2-row changer 2
A8		C	+24V

6. ELECTRIC COMPONENTS

40.Folding clamp valve harness (S46657)

Main PCB P5	SMC		Signal/ Voltage (DC)
A1	1A	A	Folding clamp A
A3		C	+24V
B1	1B	A	Folding clamp B
B3		C	+24V
A2	2A	A	Inner clamp A
A3		C	+24V
B2	2B	A	Inner clamp B
B3		C	+24V
A4	3A	A	Center blade A
A3		C	+24V
B4	3B	A	Center blade B
B3		C	+24V
A5	4A	A	Sewing clamp A
A3		C	+24V
B5	4B	A	Sewing clamp B
B3		C	+24V
A6	5	A	Folding base 10
A8		C	+24V
B6	6	A	Folding base 1.5
A8		C	+24V
A7	7	A	Label
A8		C	+24V
B7	8	A	Vacuum (Suction)
A8		C	+24V
A9	9	A	Rise-and-fall
A8		C	+24V
B9	10	A	Tucking blade 1
B8		C	+24V
A10	11	A	Tucking blade 2
B8		C	+24V
B10	12	A	Tucking blade 3
B8		C	+24V
A11	13	A	Tucking blade 4
B8		C	+24V
B11	19	A	Stacker wiper
A13		C	+24V
A12	20	A	Stacker bar inside
A13		C	+24V
B12	21	A	Stacker bar outside
A13		C	+24V
A14	22	A	Stacker roller
A13		C	+24V

41.Area sensor harness (S46650)

Area sensor X (S46648)

Area sensor Y (S46649)

Area sensor harness			Area sensor X		Area sensor Y		Signal/ Voltage (DC)
Main PCB P20	Relay A	Relay B	Relay	Sensor	Relay	Sensor	
1	1	-	1	X+ (Brown)	-	-	+24V
2	2	-	2	X+ (Black)	-	-	X over travel left
3	3	-	3	X+ (Blue)	-	-	±0V
4	4	-	4	X- (Brown)	-	-	+24V
5	5	-	5	X- (Black)	-	-	X over travel right
6	6	-	6	X- (Blue)	-	-	±0V
7	-	1	-	-	1	Y+ (Brown)	+24V
8	-	2	-	-	2	Y+ (Black)	Y over travel up
9	-	3	-	-	3	Y+ (Blue)	±0V
10	-	4	-	-	4	Y- (Brown)	+24V
11	-	5	-	-	5	Y- (Black)	Y over travel down
12	-	6	-	-	6	Y- (Blue)	±0V
13	7	-	7	XO (Brown)	-	-	+24V
14	8	-	8	XO (Black)	-	-	X home position
15	9	-	9	XO (Blue)	-	-	±0V
16	-	7	-	-	7	YO (Brown)	+24V
17	-	8	-	-	8	YO (Black)	Y home position
18	-	9	-	-	9	YO (Blue)	±0V

42.Clamp in harness (S46652)

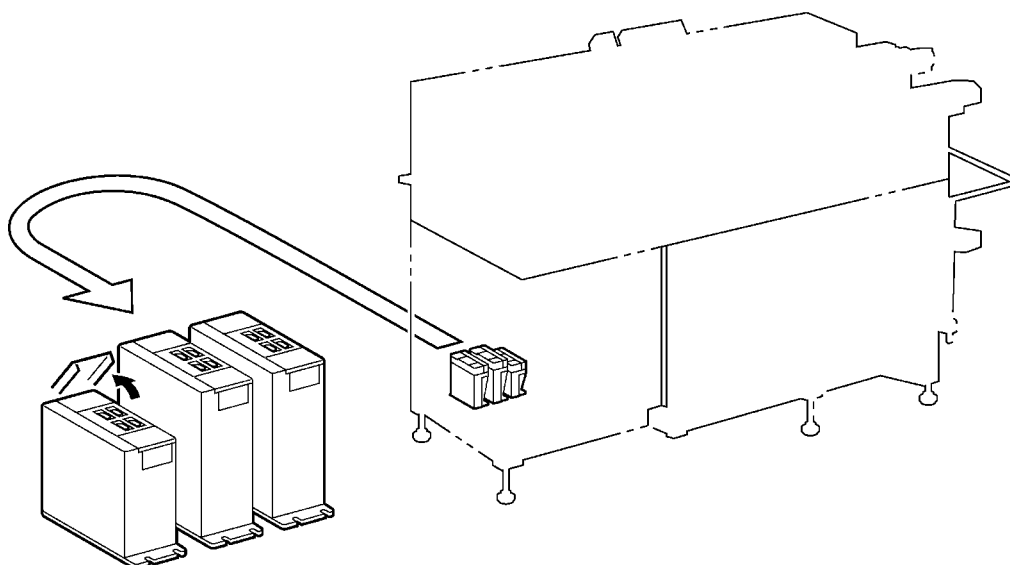
Clamp in sensor (S46651)

Clamp in harness		Clamp in sensor		Signal/ Voltage (DC)
Main PCB P19	Relay	Relay	Sensor	
1	1	1	C1 (Brown)	+24V
2	2	2	C1 (Black)	Clamp in 1
3	3	3	C1 (Blue)	±0V
4	4	4	C2 (Brown)	+24V
5	5	5	C2 (Black)	Clamp in 2
6	6	6	C2 (Blue)	±0V

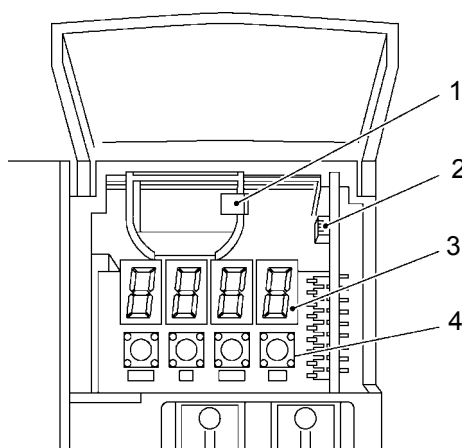
6-8. Servo amplifier

6-8-1. Names of major parts

< Servo amplifier >

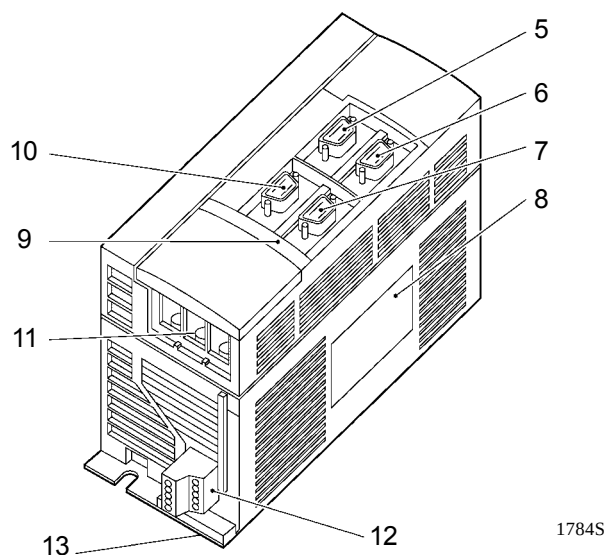


1782S



1783S

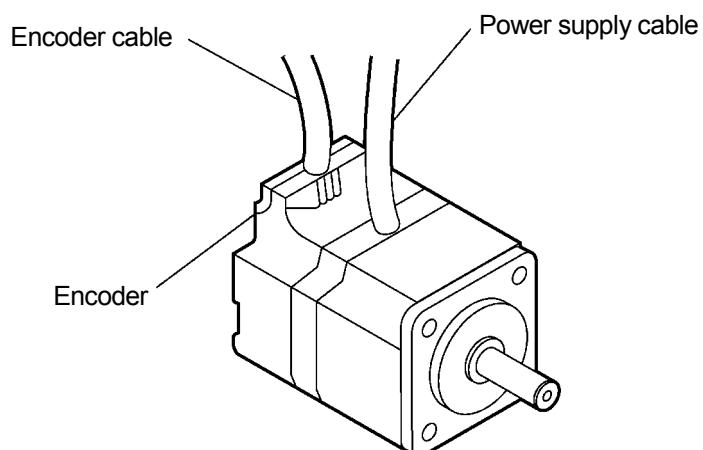
No.	Name, Use
1	Battery holder The battery for position data preservation is contained absolutely. It does not use by BAS-761, 7610.
2	Connector for battery (CON1) The battery for position data preservation is connected absolutely. It does not use by BAS-761, 7610.
3	Display The state of servo and alarm No. are displayed by the 4-figure 7 segment LED.
4	Operation part Operate state display, diagnosis, alarm, parameter setting. MODE : The mode is changed. UP, DOWN : The display and data in each mode are changed. SET : The data of a parameter is set up.



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No.	Name, Use
5	Input and output signal connector (CN1A) A signal of main PCB is connected.
6	Input and output signal connector (CN1B) A signal of main PCB is connected. Usually, it is not used.
7	The connector for communication It connects with PC or an analog monitor is outputted.
8	Rated plate
9	Charge lamp The light is switched on when the electric charge exists in the main circuit. * Under lighting -- an electric wire -- tying -- supporting -- etc. -- do not carry out
10	Detection dexterous connector Servo motor encoder connector
11	The main circuit terminal (TE1) An input power supply and a servo motor are connected.
12	Control circuit terminal (TE2) A control circuit power supply is connected.
13	Protection grounding (PE) terminal It is a grounding terminal.

< Servo motor >



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6. ELECTRIC COMPONENTS

6-8-2. Abnormalities and a measure

If abnormalities occur on servo amplifier or a motor (E-870, 880, 890), "AL. **" will be displayed on the display part of servo amplifier. The meaning of an error code and the list of check items are as follows.

< Servo amplifier error code >

Error code	The contents of an error	Check and measure
AL. 10	Voltage is insufficient.	1.Power supply voltage is low. (The voltage between L1 - L2 is less than 160V.) 2.There was an instant power failure. 3.Power supply ON was carried out immediately after the power supply OFF.
AL. 12	Memory problem 1	Even if it removes connectors CN1A, CN1B and CN2, and carries out power supply ON, alarm comes out. → Exchange the servo amplifier.
AL. 13	Clock problem	
AL. 15	Memory problem 2	
AL. 16	Encoder problem 1	1.The connector CN2 does not connect. 2.Malfunction of the encoder harness. 3.Failure of encoder. → Exchange the servo motor.
AL. 17	PCB problem 2	Even if it removes connectors CN1A, CN1B and CN2, and carries out power supply ON, alarm comes out. → Exchange the servo amplifier.
AL. 19	Memory problem 3	
AL. 20	Encoder problem 2	1.The encoder harness of the motor side does not connect. 2.Malfunction of the encoder harness.
AL. 24	Motor output earth-fault	1.The power supply input line L1 or L2, and the servo motor output line U, V or W touch 2.The power supply input line L1 or L2, or the servo motor output line U, V or W deteriorated. → Exchange their line of the servo motor.
AL. 25	The absolute position was disappeared.	Drop voltage of the capacitor in a encoder. → Exchange the servo motor.
AL. 30	Regeneration problem	1.Continuation operation of the power supply voltage is carried out in the high state. (The voltage between L1 - L2 is more than 253V.) 2.The permission regeneration electric power was exceeded. 3.Turn the power OFF, and wait five minutes.
AL. 31	Over speed	1.Failure of encoder. → Exchange the servo motor. 2.Problem of servo amplifier parameter. → Exchange the servo amplifier.
AL. 32	Over current	1.Output line of servo motor U, V or W touch or earth-faulted. 2.Even if it removes connectors CN1A, CN1B and CN2, and carries out power supply ON, alarm comes out. → Exchange the servo amplifier. 3.The over-current detection circuit incorrect-operated by the outer noise.
AL. 33	Over-voltage	1.Power supply voltage is high. (The voltage between L1 - L2 is less than 260V.) 2.Failure of built-in regeneration resistor. → Exchange the servo amplifier.
AL. 35	Instruction pulse problem	1.Malfunction of servo harness. 2.The noise mixed in the instruction pulse. 3.Failure of main PCB.
AL. 37	Parameter problem	Exchange the servo amplifier.
AL. 45	The main circuit element overheating	Exchange the servo amplifier.
AL. 46	Servo motor overheating	1.The circumference temperature of a servo motor is over 40 degrees. 2.Problem in attachment of a servo motor. 3.The heat protector of a servo motor broke down. → Exchange the servo motor.
AL. 50 AL. 51	Over-load	1.The feeding unit collided with the obstacle. 2.The connection mistake of a servo motor output line U, V, W. 3.Failure of encoder. → Exchange the servo motor.
AL. 52	An error is too large.	1.Harness does not connect, or connection mistake of harness. 2.The torque by the shortage of power supply voltage is insufficient. 3.The feeding unit collided with the obstacle. 4.Failure of encoder. → Exchange the servo motor.
8.8.8.8	Watcher	Exchange the servo amplifier.
AL. E6	Emergency stop	Poor connection of harness, or disconnection

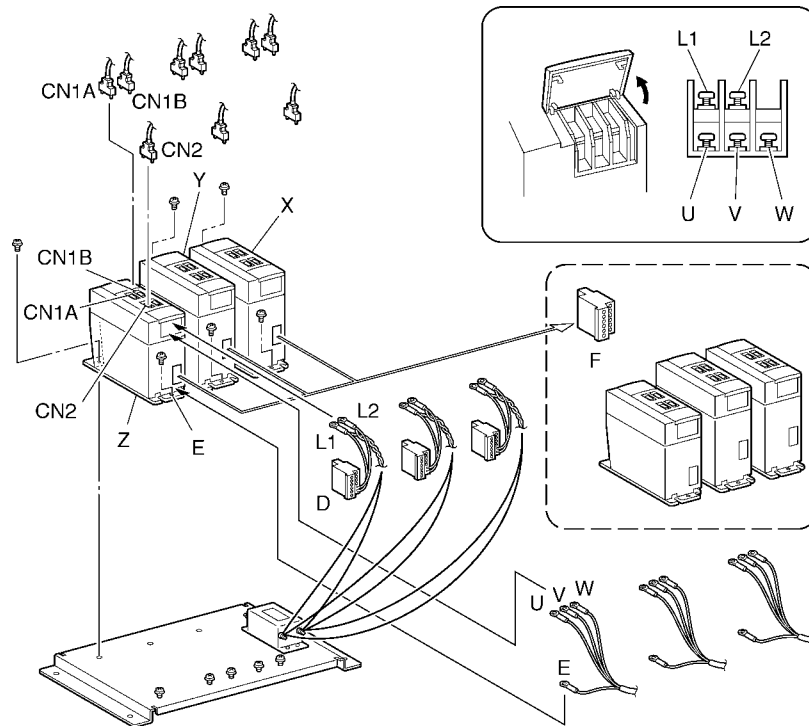
6-8-3. Exchange the servo amplifier

Note

Servo amplifier does not operate, if the parameter is not set up.

When you exchange servo amplifier, check that the parameter is set as servo amplifier. As for the servo amplifier with which the parameter is set up, the seal is stuck on the lower part of the side.

Although the servo amplifier X and Y are the same form, each parameter setup differs. It cannot be used being able to change.



1904S

Remove connector CN1A, 1B (servo harness), and CN2 (encoder harness).

Open the cover of servo amplifier and remove the terminal U, V and W, and the ground (E) (motor power harness).

Remove the terminal L1, L2 (servo power harness).

Remove the green connector D. (The line L11 and L21 does not remove.)

Exchange the servo amplifier.

Remove the green connector F from new servo amplifier.

Each harness is attached like origin. A terminal and a connector attach a position to prevent mistakes.

Note that form is [connector CN1A, 1B (servo harness), and CN2 (encoder harness)] the same.

6-9. DIP switches

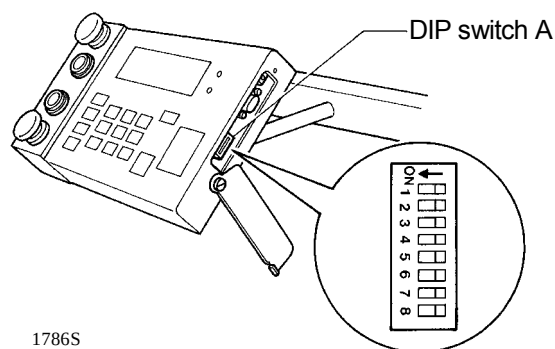
Note

Always turn off the power supply before changing any of the DIP switch settings.

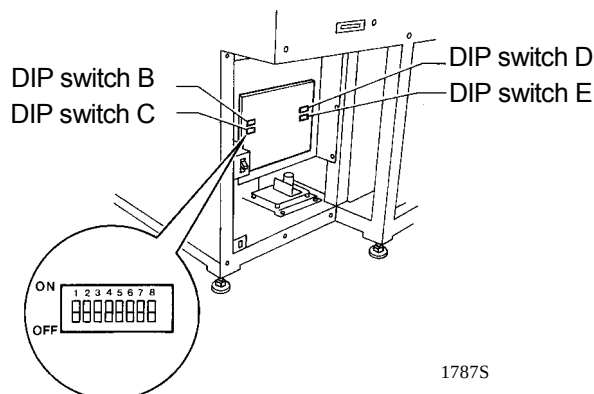
The function of the DIP switches are subject to changes without notification.

If DIP switches B-1 to B-6 are ON, be sure to check the cylinder movement and data version thoroughly. In some cases a peculiar error may be displayed.

< DIP switch positions >



1786S



1787S

< Functions of operation panel DIP switches >

DIP switch A

No.	Motion when set to ON
1	In automatic, pattern matching and label attachment modes, the work clamp stops momentarily before feeding to the home position.
2	Low feeding speed (Machine head → Folder)
3	Low feeding speed (Folder → Machine head)
4	Not available (Should be set to OFF)
5	Not available (Should be set to OFF)
6	Not available (Should be set to OFF)
7	After the power is turned on, three pockets are sewn at 3,000 rpm. (The measure against a cold district)
8	Machine head operation check, stacker operation check

< Functions of DIP switches on main circuit board >

DIP switch B

No.	Motion when set to ON
1	Mismatches between folder numbers and program numbers are ignored
2	Clamp vertical sensor is ignored
3	Needle racking cylinder sensor is ignored
4	Double cylinder sensor is ignored
5	24V/36V power supply voltage check is ignored
6	Single and double clamp data check is ignored
7	Not available (Should be set to OFF)
8	Not available (Should be set to OFF)

DIP switch C

No.	Motion when set to ON
1	7 stitches counted before upper thread breakage is detected OFF : 3 stitches counted before upper thread breakage is detected
2	After sewing, the work clamp and machine head return to the previous standby position, even if folding has been completed.
3	Movement to the feed destination occurs immediately when the program data requires it.
4	After sewing, the timer starts 0.2 seconds after the work clamp is raised.
5	Not available (Should be set to OFF)
6	Not available (Should be set to OFF)
7	Not available (Should be set to OFF)
8	Not available (Should be set to OFF)

DIP switch D

No.	Motion when set to ON
1	The gauge standby position is always forward. When OFF : The gauge standby position is at the back.
2	Continuous label attachment mode When OFF : Alternate label attachment mode
3	Folder operates at low speed
4	Folder procedure changes
5	Folding is released when base 1.5 is raised
6	Not available (Should be set to OFF)
7	Not available (Should be set to OFF)
8	Not available (Should be set to OFF)

DIP switch E

No.	Motion when set to ON
1	Not available (Should be set to OFF)
2	Not available (Should be set to OFF)
3	Not available (Should be set to OFF)
4	Not available (Should be set to OFF)
5	Not available (Should be set to OFF)
6	Not available (Should be set to OFF)
7	Not available (Should be set to OFF)
8	Not available (Should be set to OFF)

6-10. Error code

When there is the possibility that harness is faulty, check connections and pin omissions, etc. with reference to "6-7-2. Harness connecting pin number table".

It is possible for it to be made not to indicate by setup of a DIP switch by error provisionally depending on the contents of an error. However, set up after checking the safety of operation of a sewing machine in that case. Moreover, be sure to remove the factor of abnormalities immediately and return a setup.

Error code	Contents	Disposal / factor / check
E-500	The abnormalities in 24V system voltage (rise)	- Primary side input voltage is high. - The secondary side connection mistake of the power supply unit transformer 2 - Evasion by DIP switch B-5 ON is possible.
E-501	The abnormalities in 24V system voltage (descent)	- The fuse F2 on a power supply board has run out. - Primary side input voltage is low. - The secondary side connection mistake of the power supply unit transformer 2 - Evasion by DIP switch B-5 ON is possible.
E-502	The abnormalities in 36V system voltage (rise)	- Primary side input voltage is high. - Evasion by DIP switch B-5 ON is possible.
E-503	The abnormalities in 36V system voltage (descent)	- The fuse F3 on a power supply board has run out. - Primary side input voltage is low. - The secondary side connection mistake of the power supply unit transformer 2 - Evasion by DIP switch B-5 ON is possible.
E-504	The abnormalities in primary side voltage (rise)	- Primary side input voltage is high. - The primary side connection mistake of a transformer 1
E-505	The abnormalities in primary side voltage (descent)	- Primary side input voltage is low. - The primary side connection mistake of a transformer 1 - The fuses F2 and F3 on a power supply board have run out.
E-510 E-511 E-512 E-513	The needle bar is in positions other than an upper needle position. (WARNING)	- Turn the machine pulley to move the needle bar to its upper needle position. - Malfunction of machine sensor (needle up)
E-520	Upper thread breakage (WARNING)	<Correct detection> - Upper thread has broken. <Incorrect detection (Upper thread has not broken.)> - Poor adjustment of upper thread detector. - Poor adjustment or dirt of an optical fiber tip position. - Malfunction of upper thread detector - Malfunction of machine sensor harness A or B. - There are few stitch numbers before upper thread breakage is detected. →DIP switch C-1 turn ON.
E-530	Sewing clamp and sewing program number do not match.	<Correct detection> - A number is made in match. * Turn ON DIP switch B-1 and carry out error disregard. (A data check is surely carried out.) <Incorrect detection (Recognition of an actual jig pattern and a jig pattern sensor is different.)> - Malfunction of jig pattern PCB. - Dirt is in photo sensors on jig pattern PCB. - Malfunction of jig pattern harness.
E-535	Retractable are for double (0 to 31) but data does not contain a double switching command. (Model No. 0 - 31)	The check of data (Input the double switching command.) * Turn ON DIP switch B-6 and carry out error disregard. (A data check and sewing clamp are surely carried out.)

E-536	Model numbers are for single (32 - 63) but data does not contain a single switching command. (Model No. 32 - 63)	- The check of data (Delete the double switching command.) * Turn ON DIP switch B-6 and carry out error disregard. (A data check and sewing clamp are surely carried out.)
E-540	Machine head synchronization sensor error or machine head motor error	<When a motor rotates> - Malfunction of machine sensor (synchronizing). - Malfunction of machine sensor harness. <When a motor does not rotate> - Malfunction of machine motor or its servo amplifier.
E-550	Needle up stop error	- Malfunction of machine sensor ("needle up" or "synchronizing"). - Malfunction of machine sensor harness A or B. - Old servo harness Z is used. (Phenomenon : A sewing machine does not carry out reverse needle up after the thread trimming. And it rotates and stops only 2 or 3 times at a low speed.) - Poor adjustment of sensor dog. - Poor adjustment of thread trimmer cam. - Upper shaft of the sewing machine is heavy. - Malfunction of machine motor.
E-560	Malfunction of presser foot cylinder or sensor	<Presser foot operates> - Poor connection of machine sensor harness A. - Malfunction or poor connection of presser foot sensor of machine sensor harness B. <Presser foot does not operate> - Malfunction of solenoid valve No.25. - Poor connection of main valve harness No.25.
E-570	2 row sensor error	<2 row change operates> - Poor connection of 2 row sensor harness A or B. - Malfunction or poor connection of two cylinder sensors (D-A96 or D-7A1). - Evasion by DIP switch B-4 ON is possible. <2 row change does not operate> - Malfunction of solenoid valve No.14 or 15. - Poor connection of main valve harness No.14 or 15. - Mechanical poor adjustment of a clamp
E-580	Malfunction of zigzag cylinder or sensor	<Zigzag operates> - Poor connection of machine sensor harness A. - Malfunction or poor connection of zigzag sensor of machine sensor harness B. <Zigzag does not operate> - Malfunction of solenoid valve No.26. - Poor connection of main valve harness No.26.
E-600	No sewing data	Read data.
E-700	Read error of floppy disk	Malfunction of the floppy disk.
E-701	Write error of floppy disk	- Disconnection or poor connection of FDD harness or FDD power supply harness. - Failure of FDD.
E-710	No sewing data for number specified.	Check the floppy disk or specified number.
E-711	Data writing carried out with no sewing data	(Omission)
E-720	No disk in FDD.	(Omission)
E-730	Floppy disk is write-protected.	Check the write protector of the floppy disk.
E-740	Insufficient free space on floppy disk	Check the floppy disk.
E-750	Floppy disk cannot be formatted.	- The floppy disk is protected. - Malfunction of the floppy disk. - Failure of FDD.

6. ELECTRIC COMPONENTS

E-780	Sewing data exceeds sewing area	(Omission)
E-781	No end code in sewing data	(Omission)
E-800	EMERGENCY STOP button pressed.	(Omission)
E-801	EMERGENCY STOP button pressed during sewing.	(Omission)
E-802	EMERGENCY STOP button pressed during programming.	Reset is impossible. Turn the power OFF.
E-803	EMERGENCY STOP button pressed during programming.	(Omission)
E-810	EMERGENCY STOP button is not connected.	- Disconnection of switch box harness. - Poor connection of EMERGENCY STOP switch. - Poor connecting point of EMERGENCY STOP switch.
E-820	No air, or air chuck is turned OFF	- Air pressure is low. - The poor setting of an air pressure switch (0.35 Mpa) - Malfunction of the mechanical valve
E-821	No air, or air chuck is turned OFF	Reset is impossible. Turn the power OFF.
E-830	X right over travel switch activated	- The sewing clamp is in the position of over travel. - Disconnection or poor connection of area sensor harness or area sensor X. - Poor adjustment of the position of sensor.
E-840	X left over travel switch activated	
E-850	Y up over travel switch activated	- The sewing clamp is in the position of over travel. - Disconnection or poor connection of area sensor harness or area sensor Y. - Poor adjustment of the position of sensor.
E-860	Y down over travel switch activated	
E-870	X motor problem	<Check the error indicator of the servo amplifier.> - Primary side input voltage is high or low. - the load by the defect of low temperature or malfunction of the mechanism. - Continuation high-speed rotation at the time of high temperature (especially machine head (Z) motor) - Disconnection or poor connection of servo harness, encoder harness, servo power harness or servo motor power harness - Malfunction of the servo motor (encoder) or the servo amplifier.
E-880	Y motor problem	
E-890	Machine head motor (Z) problem	- Disconnection or poor connection of encoder harness Z. - Disconnection or poor connection of servo harness Z. - Malfunction of the main PCB.
E-891	Machine head motor (Z) problem (The XY direction position gap at the time of sewing)	
E-900	Malfunction of folding clamp cylinder or sensor	<Cylinder operates> - Disconnection or poor connection of the folding clamp sensor. - Poor adjustment of the folding clamp sensor. <Cylinder does not operate> - Malfunction of solenoid valve No.1A or 1B. - Poor connection of folding clamp valve harness No.1A or 1B.
E-901	Malfunction of inner clamp cylinder or sensor	<Cylinder operates> - Disconnection or poor connection of the folding clamp sensor. - Poor adjustment of the folding clamp sensor. <Cylinder does not operate> - Malfunction of solenoid valve No.2A or 2B. - Poor connection of folding clamp valve harness No.2A or 2B.
E-902	Malfunction of center blade cylinder or sensor	<Cylinder operates> - Disconnection or poor connection of the folding clamp sensor. - Poor adjustment of the folding clamp sensor. <Cylinder does not operate> - Malfunction of solenoid valve No.3A or 3B. - Poor connection of folding clamp valve harness No.3A or 3B.

E-903	Malfunction of folding base cylinder or sensor	<Cylinder operates> • Disconnection or poor connection of the folding clamp sensor. • Poor adjustment of the folding clamp sensor. <Cylinder does not operate> • Malfunction of solenoid valve No.5 or 6. • Poor connection of folding clamp valve harness No.5 or 6.
E-910	X axis positioning error	• Slack of a feed timing belt • The backlash of a feeding gear is large. • Disconnection or poor connection of the area sensor harness or the area home position sensor. • Poor adjustment of the sensor position
E-920	Y axis positioning error	
E-960	The abnormalities in clamp in sensor	• Disconnection or poor connection of the clamp in sensor • Poor adjustment of the sensor dog.
E-970	Malfunction of work clamp cylinder or sensor	<Cylinder operates> • Disconnection or poor connection of the work clamp sensor. • Poor adjustment of the work clamp sensor. • Evasion by DIP switch B-2 ON is possible. <Cylinder does not operate> • Malfunction of solenoid valve No.4A or 4B. • Poor connection of folding clamp valve harness No.4A or 4B.

6-11. Exchange of PCB

6-11-1. Main PCB

After main PCB exchange should initialize a memory.

1. All the connectors that open a control box and are connected to the main PCB are removed.

Note

When remove connectors, do not pull a harness portion. The harness may disconnect.

2. Remove the main PCB from six supports.
3. Remove the two PROMs from the removed main PCB and attach in the new main PCB.
4. Install the main PCB to the six supports. It attaches so that the main PCB may not be sagged.
5. Connectors are attached like origin.
6. While holding down "RESET" switch, turn ON the power switch. A memory is initialized.

6-11-2. Panel PCB

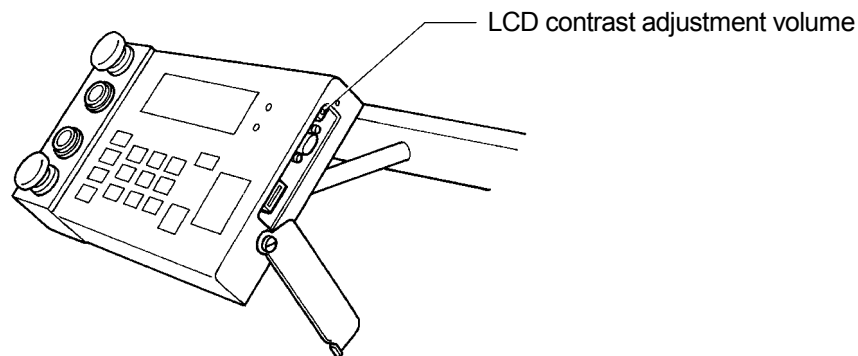
After panel PCB exchange should initialize a panel.

1. All the connectors that open a panel and are connected to the panel PCB are removed.

Note

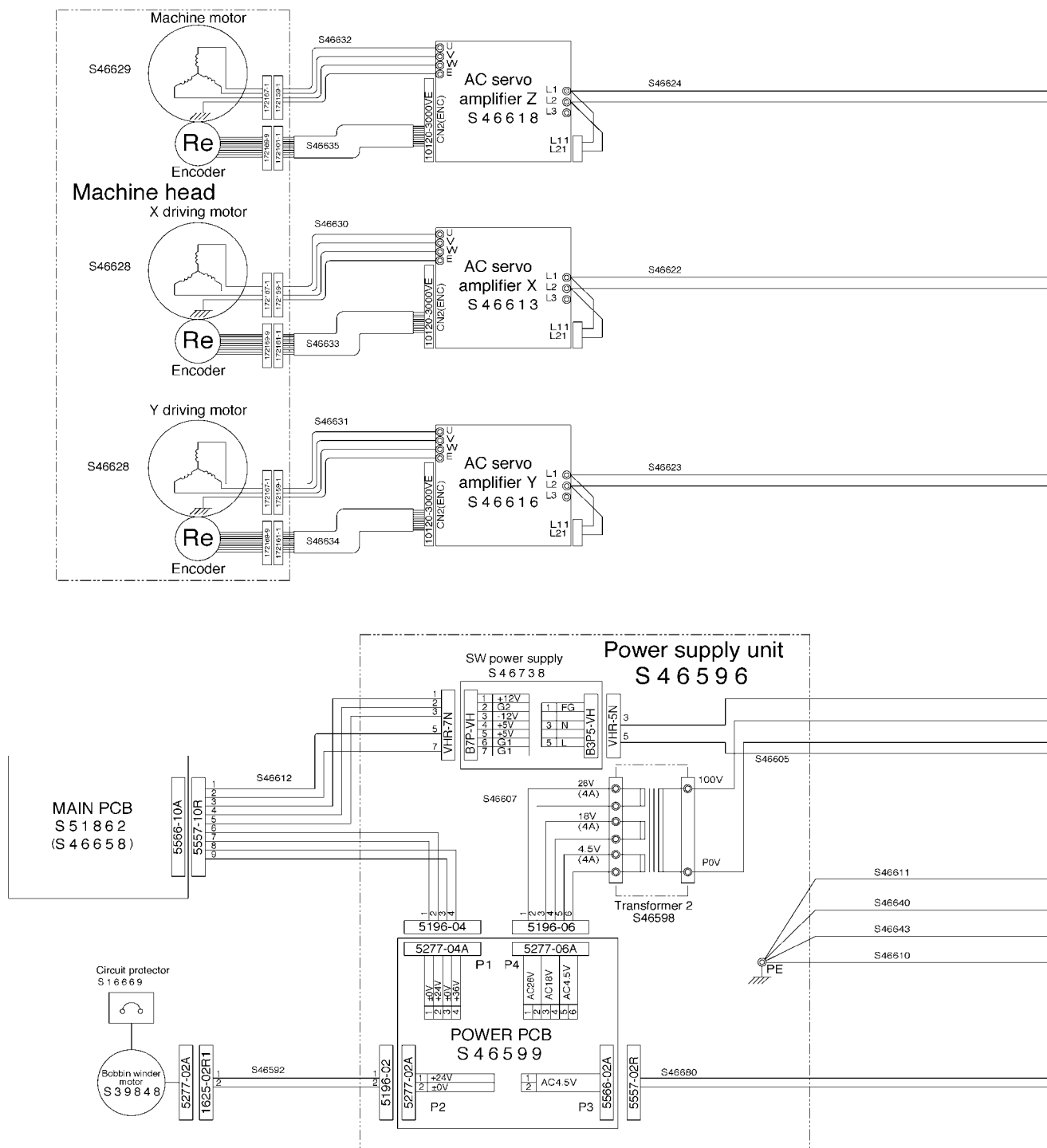
When remove connectors, do not pull a harness portion. The harness may disconnect.

2. Remove eight screws and remove the panel PCB.
3. Remove the PROM from the removed panel PCB and attach in the new panel PCB.
4. Install the panel PCB to the panel cover using eight screws.
5. Connectors are attached like origin.
6. While holding down "STEP" switch, turn ON the power switch. A panel is initialized.
7. Turn OFF the power switch. While holding down "FOLDER MODE" switch, turn ON the power switch. A display language setting screen is displayed on the operating panel. A display language is set up.
8. After positioning operation finishes, a setup of the date or time is performed.
9. Adjusting the liquid crystal display. Adjustment opens the cover of the panel right and is performed by turning volume with a previous thin plus screwdriver etc.

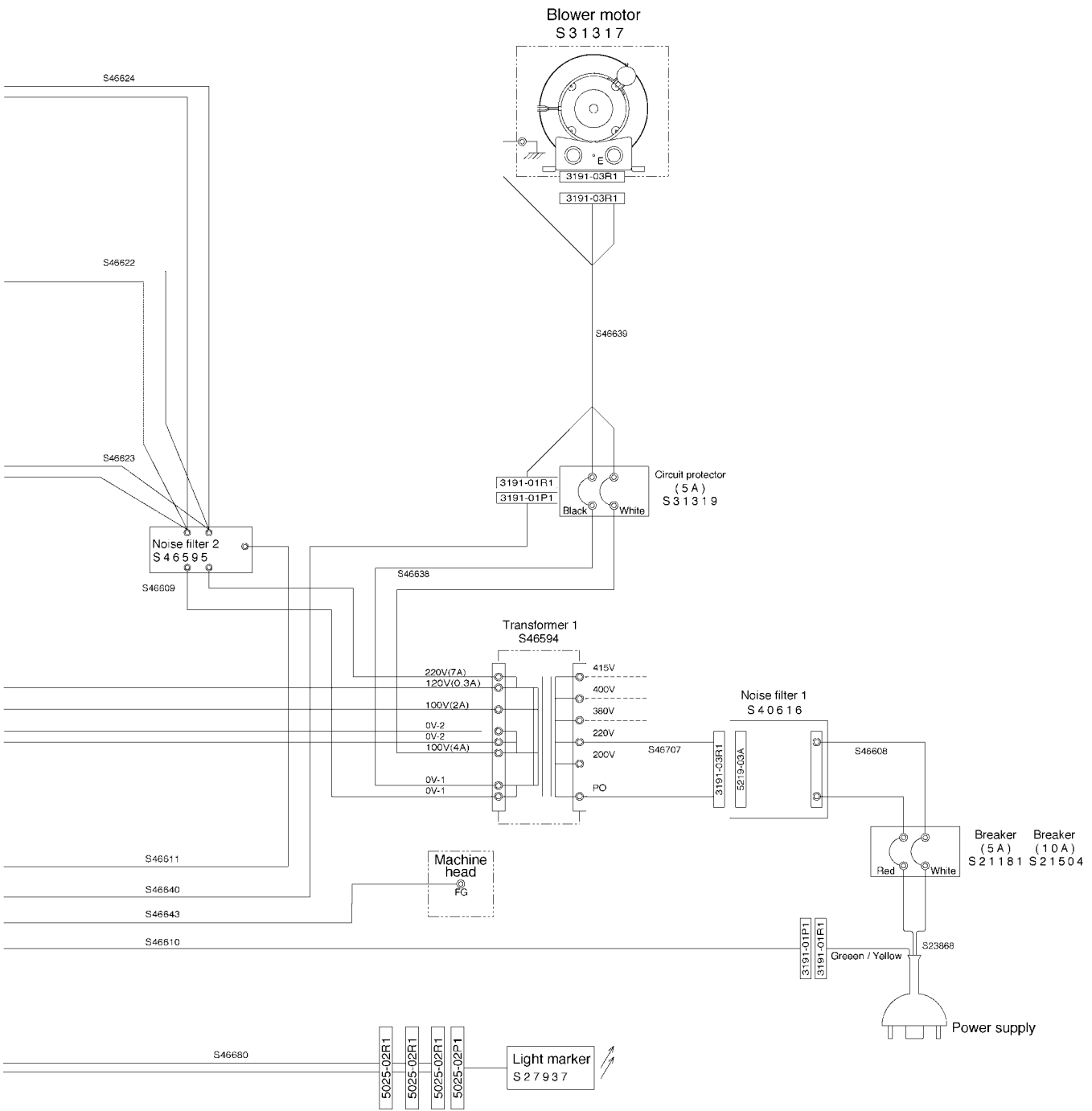


1903S

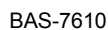
6-12. Control circuit block diagram



1860S



6-55





7. FOLDING MACHINE

7-1. Basic adjustments for delivery

There is not perfect compatibility between the folding machine and the sewing machine. A folding machine which is ordered at the same time as the sewing machine does not have to be readjusted much because the folding machine has been adjusted to the sewing machine at shipping. But a folding machine which is ordered separately needs to be readjusted when delivered because it has been adjusted to a different sewing machine at shipping.

Never loosen the screws securing the sewing clamp (Figure 3), which is attached using a gauge.

Adjustment is performed by loosening the screws securing the center blade assembly (Figure 1), the inner clamp assembly (Figure 2) and the folding clamp assembly (Figure 4). The adjustment procedures are described below.

1. Supply air, then turn ON the power. A home position is detected.
2. Attach the folding machine to the sewing machine, then lock the folding machine.
3. Perform the test mode operation to check that the needle does not contact the sewing clamp (Figure 3). While performing the test, never sew the body.
4. If the needle does not descend into the groove center of the sewing clamp (Figure 3), shift the programmed pattern in parallel or reprogram partially.
5. Place the body under the center blade (Figure 1). In the step mode, when the sewing clamp (Figure 3) covers the center blade (Figure 1), adjust the center blade (Figure 1) so that its edge comes to the approximate groove-center of the sewing clamp (Figure 3). (The position of X directions can be adjusted by the program.) Refer to instruction manual of programmer.
6. The inner clamp (Figure 2) and the folding clamp (Figure 4) must be adjusted against the center blade (Figure 1).
7. Actually sew the pockets. If a problem occurs, see the following pages to adjust the parts.

Ex. Three corner (home plate) model

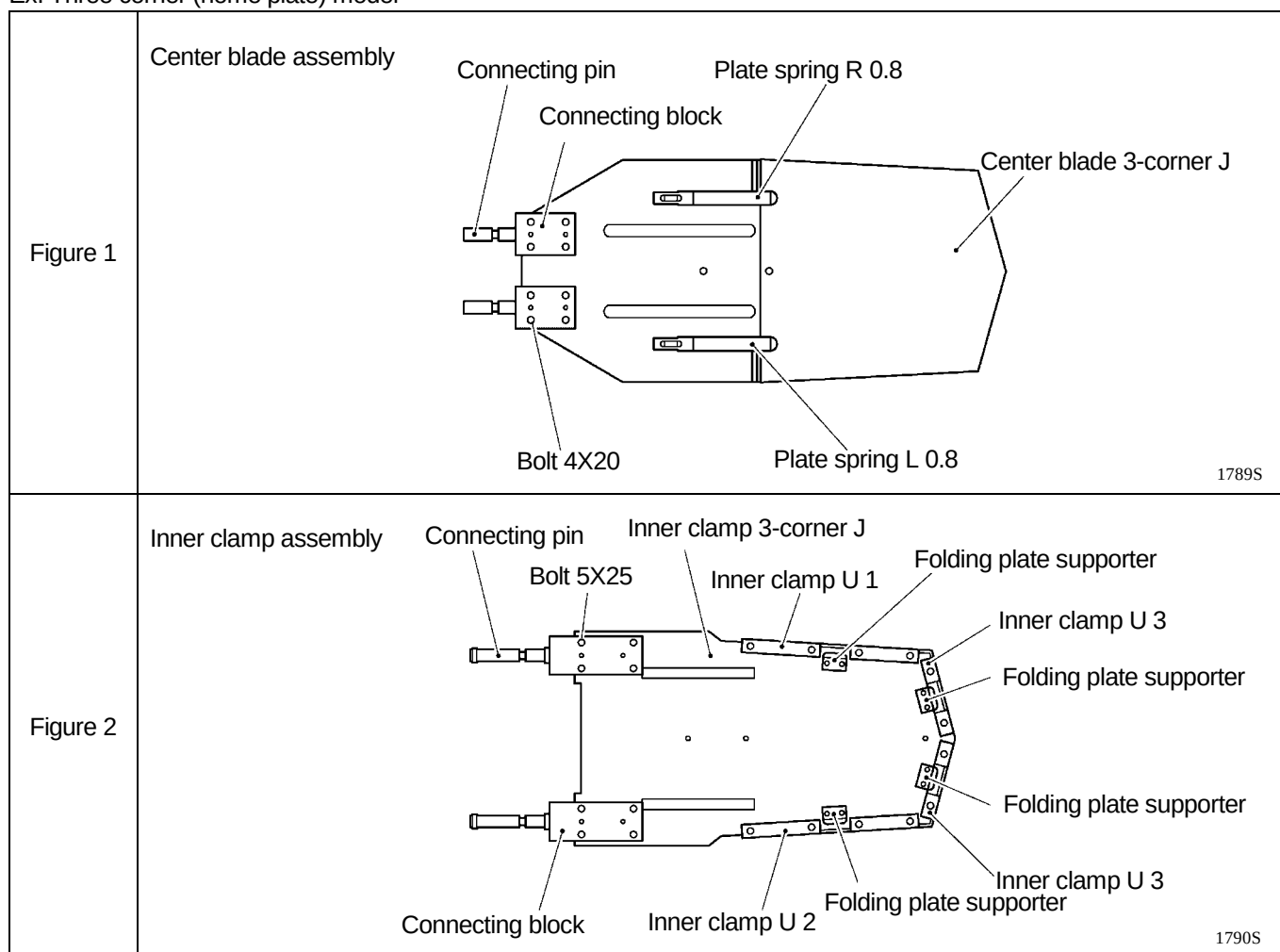
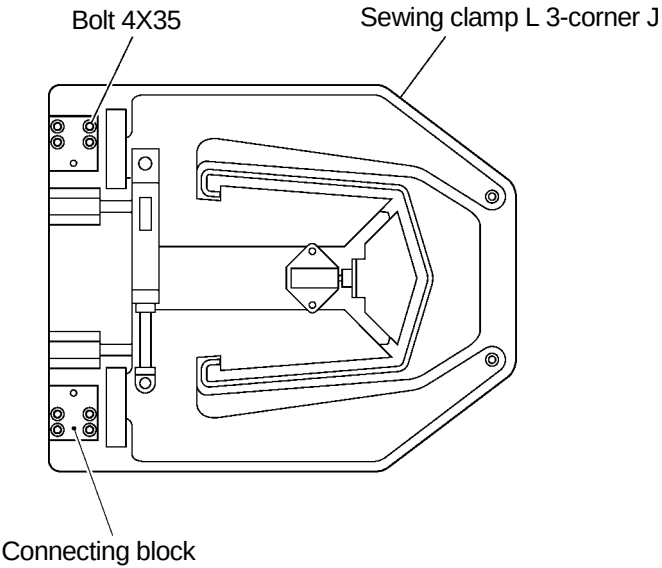
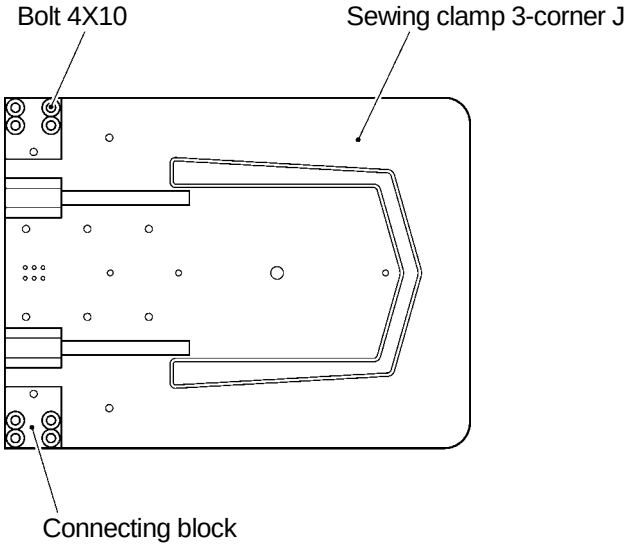
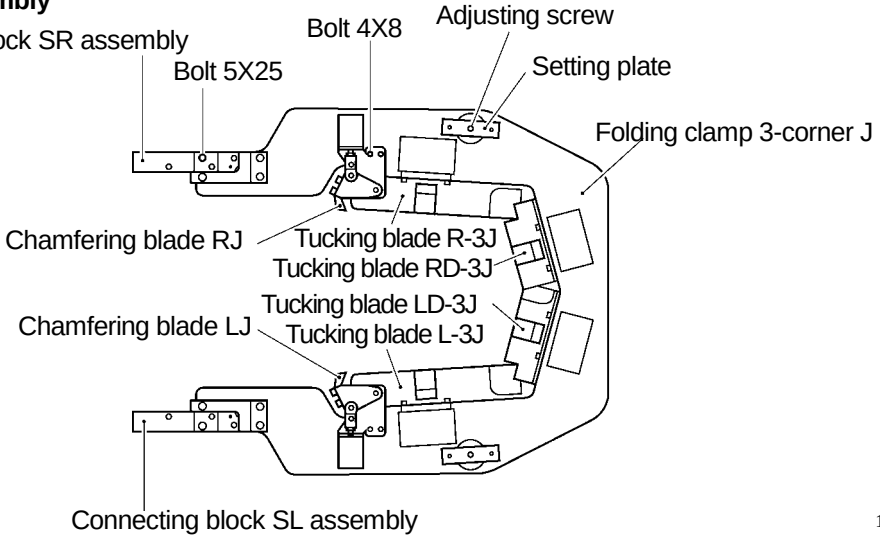
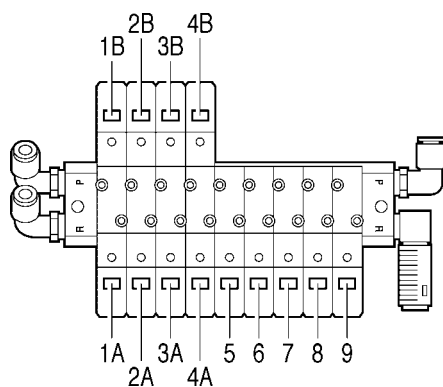


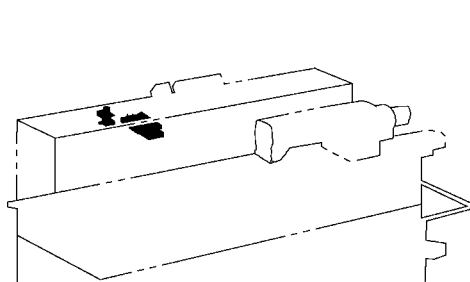
Figure 3	Sewing clamp assembly (Retractable type)  Bolt 4X35 Sewing clamp L 3-corner J Connecting block 1793S
	Sewing clamp assembly  Bolt 4X10 Sewing clamp 3-corner J Connecting block 1791S
Figure 4	Folding clamp assembly  Connecting block SR assembly Bolt 5X25 Bolt 4X8 Adjusting screw Setting plate Folding clamp 3-corner J Chamfering blade RJ Tucking blade R-3J Tucking blade RD-3J Chamfering blade LJ Tucking blade LD-3J Tucking blade L-3J Connecting block SL assembly 1792S

7-2. Valve

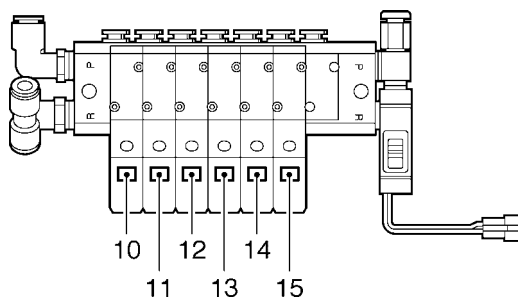


1354S

1	Folding clamp	6	Folding base (1.5 mm-stroke)
2	Inner clamp	7	Label attachment device (Option)
3	Center blade	8	Suction (Vacuum)
4	Sewing clamp	9	Slide plate elevator
5	Folding base (10 mm-stroke)		



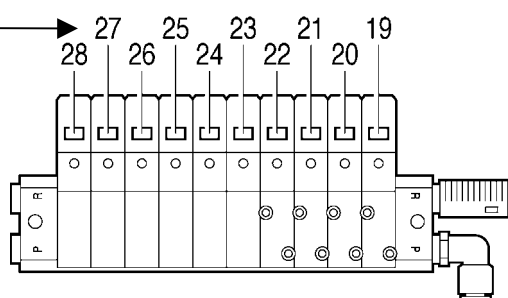
1387S



1788S

10	Folder 1	13	Folder 4
11	Folder 2	14	Retractable type sewing clamp
12	Folder 3	15	Retractable type sewing clamp

Only X1.7 rotary hook



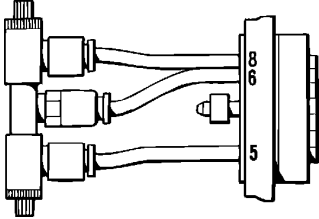
1356S

19	Stacker wiper	24	Needle blow
20	Stacker bar inside	25	Presser foot
21	Stacker bar outside	26	Zigzag
22	Roller	27	Main tension (X1.7 rotary hook)
23	Rotary hook blow	28	2 step tension

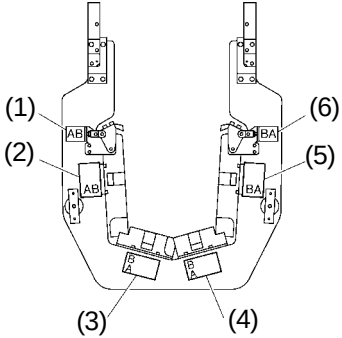
7-3. Operation order and connection of folding machine

The multi connectors and valves (page 7-03) connections are as follows.

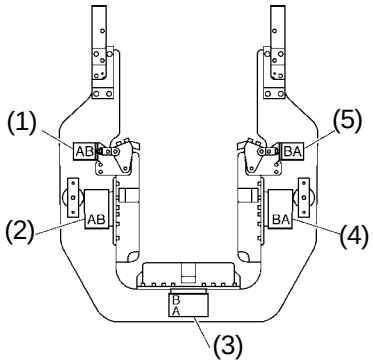
The valve operation order : Valves 10 → 13 turn ON in turn, and they turn OFF in order 10 → 11 → 13 → 12.

 Speed controller 1363S	Multi connector No.	Valve No. and Port
	1	10-B
	2	10-A
	3	11-B
	4	11-A
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	12-B
	10	12-A
	11	13-B
	12	13-A

Three corner (home plate) model

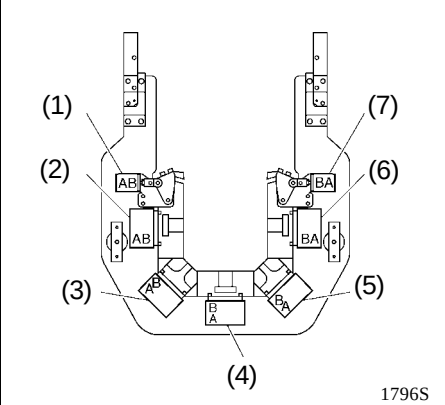
 1794S	Multi connector No.	Cylinder No. and Port
	1	(1)B, (6)B
	2	(1)A, (6)A
	3	(4)B
	4	(4)A
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	(3)B
	10	(3)A
	11	(2)B, (5)B
	12	(2)A, (5)A

Two corner (square) model

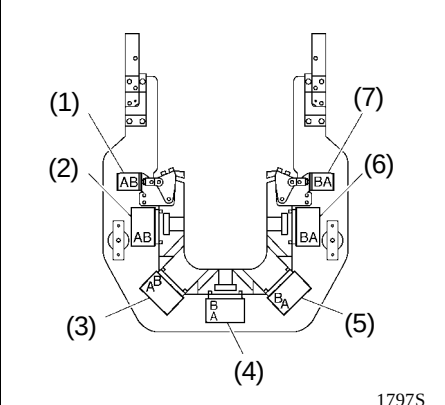
 1795S	Multi connector No.	Cylinder No. and Port
	1	(1)B, (5)B
	2	(1)A, (5)A
	3	Cap
	4	Cap
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	(3)B
	10	(3)A
	11	(2)B, (4)B
	12	(2)A, (4)A

7. FOLDING MACHINE

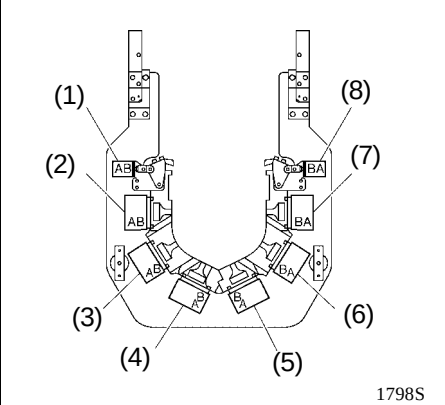
Four corner model

	Multi connector No.	Cylinder No. and Port
	1	(1)B, (7)B
	2	(1)A, (7)A
	3	(2)B, (4)B, (6)B
	4	(2)A, (4)A, (6)A
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	(3)B, (5)B
	10	(3)A, (5)A
	11	Cap
	12	Cap

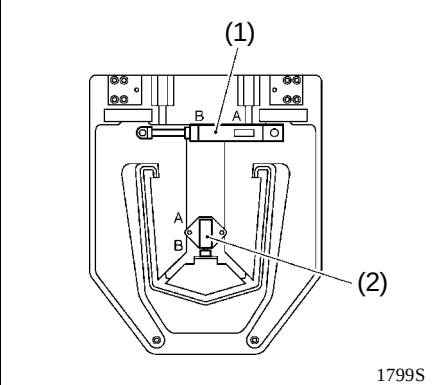
Round corner model

	Multi connector No.	Cylinder No. and Port
	1	(1)B, (7)B
	2	(1)A, (7)A
	3	(2)B, (4)B, (6)B
	4	(2)A, (4)A, (6)A
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	(3)B, (5)B
	10	(3)A, (5)A
	11	Cap
	12	Cap

Ship bottom (two arcs and point) model

	Multi connector No.	Cylinder No. and Port
	1	(1)B, (5)B, (8)B
	2	(1)A, (5)A, (8)A
	3	(2)B, (4)B, (7)B
	4	(2)A, (4)A, (7)A
	5	Speed controller
	6	Speed controller
	8	Speed controller
	9	(3)B, (6)B
	10	(3)A, (6)A
	11	Cap
	12	Cap

Retractable type sewing clamp

	Multi connector No.	Cylinder No. and Port
	1	(1)A
	2	(1)B
	3	(2)A
	4	(2)B
	5	Blanking plate
	6	Blanking plate

7-4. Adjustment

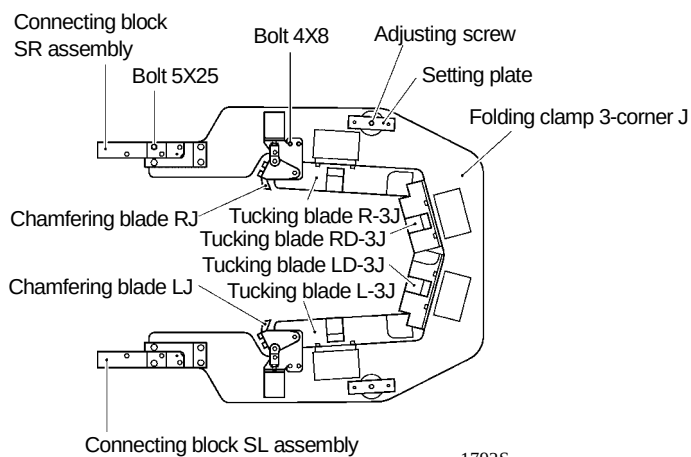
Problems are described on page 7-07. During actual use, some of the problems may happen simultaneously. Solve the biggest one first.

Reprogramming must be done only when folder adjustment is not enough to solve the problems.

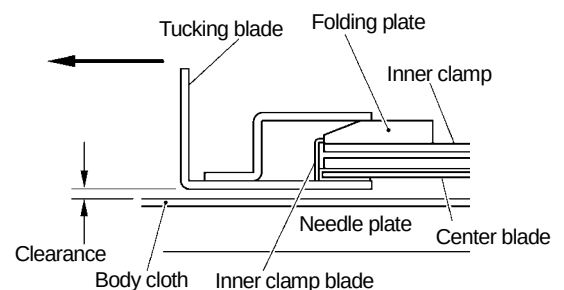
7-4-1. Fine adjustments

The function which allows fine adjustment of the folding clamp height

The purpose of this function is to reduce the clearance between the body and the tucking blades when the folding clamp falls to its lowest position. If the clearance is large, the pocket outline may enlarge when the tucking blades move in the direction of the arrow. Also, if the clearance is too small, the tucking blades come in contact with the body. In this case, when the tucking blades move in the direction of the arrow, the tucking blades hook the body and the pocket material is improperly folded in the flap margins. R and L chamfering blades do not operate smoothly. Adjust the height of the adjusting screw and set the clearance as small as possible, while preventing the above-mentioned problems.



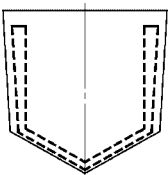
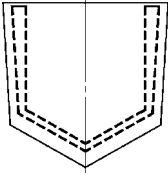
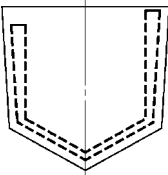
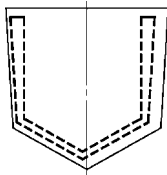
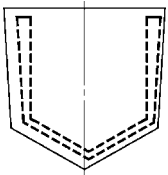
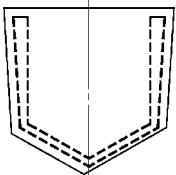
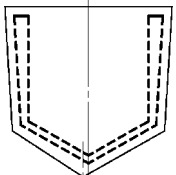
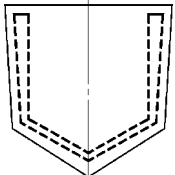
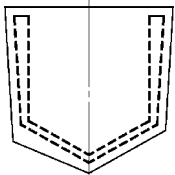
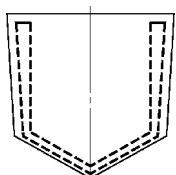
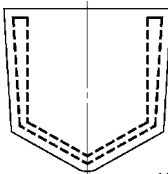
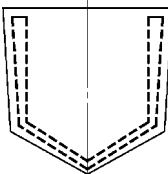
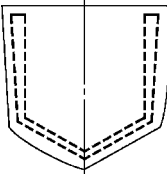
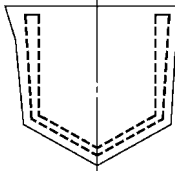
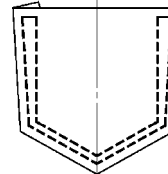
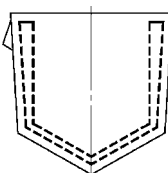
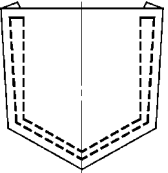
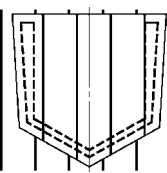
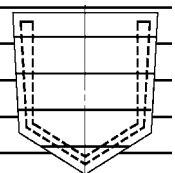
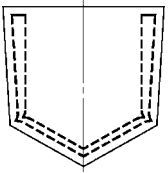
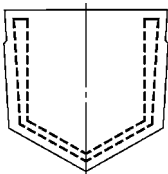
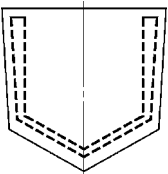
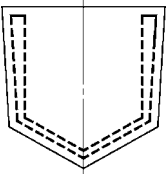
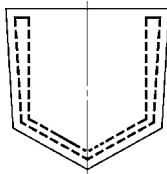
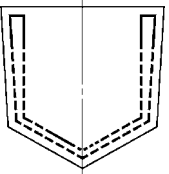
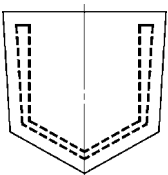
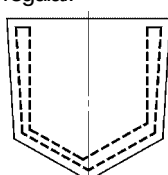
1792S



1800S

Folding clamp assembly

7-4-2. Characteristic troubles of three corner pocket model

1. Seam deviates down in parallel.  1801S	2. Seam deviates up in parallel (reverse case to 1).  1802S	3. The seam margin at the pocket top is different.  1803S	4. Seam deviates to the left in parallel.  1804S	5. Seam deviates to the right in parallel.  1805S
6. Partial seam deviates in parallel.  1806S	7. The stitch at the bottom corner is not aligned with the center line of the folded pocket.  1807S	8. The seam margin at the bottom is large.  1808S	9. The seam margin at one side of the bottom is large.  1809S	10. The seam margin is too small at the corners on both sides.  1810S
11. The folded line at the bottom corner is round.  1811S	12. The seam margin at the bottom is too small.  1812S	13. The pocket outline is curved.  1813S	14. The pocket opening is wide.  1814S	15. The pocket opening is not tucked in.  1815S
16. The flap margin at the pocket opening is out of the pocket.  1816S	17. Material protrudes from the pocket opening.  1817S	18. The pocket pattern is not aligned with the body pattern (when the pattern is vertical).  1818S	19. The pocket pattern is not aligned with the body pattern (when the pattern is horizontal).  1819S	20. The needle location at the corners is improper.  1820S
21. The pocket top is narrow.  1821S	22. The seam margin is large.  1822S	23. The pocket has skipped stitches at the sewing start.  1823S	24. The stitch pitch is uneven at the corners.  1824S	25. The pocket has skipped stitches or thread breakage at the pocket top.  1825S
26. The seam margin is large. (Heavy materials)  1826S	27. The distance between the inner row and the outer row stitches is irregular.  1827S			

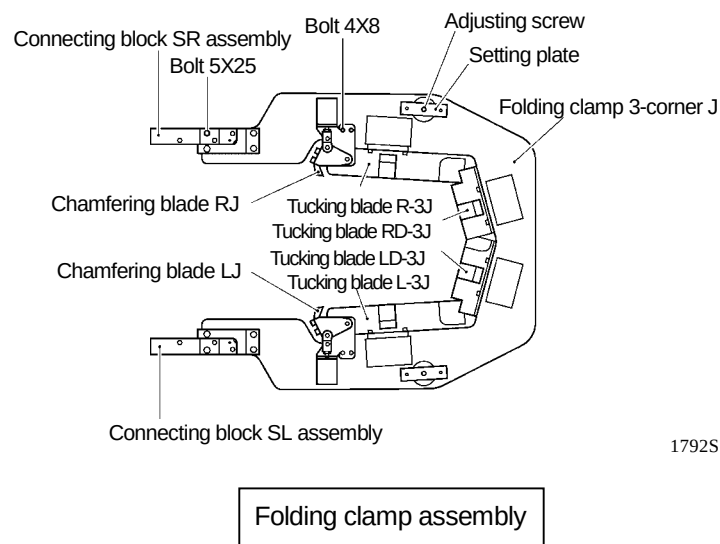
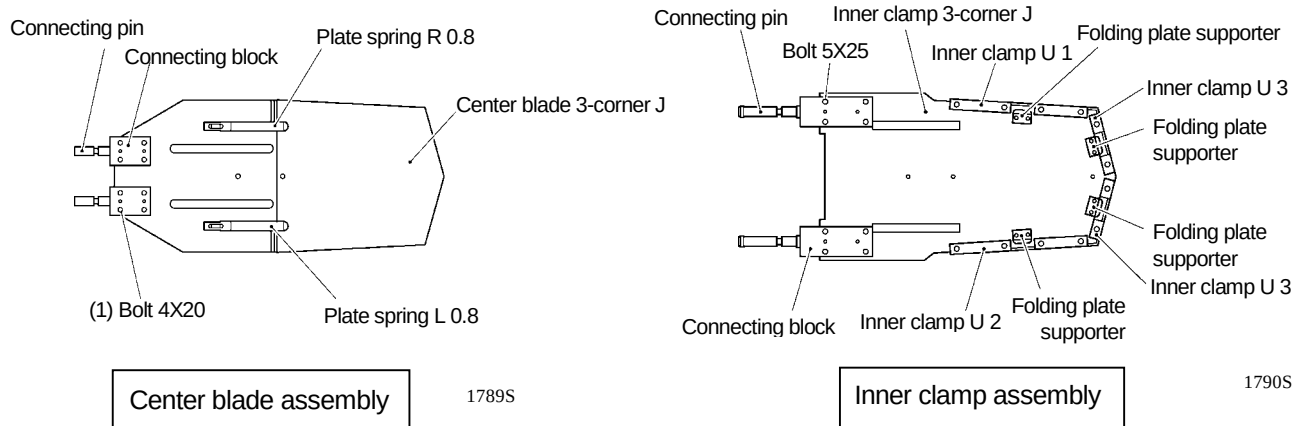
1. Seam deviates down in parallel.

<Cause>

A. The pocket material is improperly folded because the center blade is positioned above the correct position.

After loosening the eight bolts (1), shift the center blade forward in the loose holes of the connecting blocks (center blade) then fasten the bolts (1).

At this time, the inner clamp assembly and the folding clamp assembly may both need to be shifted forward at the same time.



7. FOLDING MACHINE

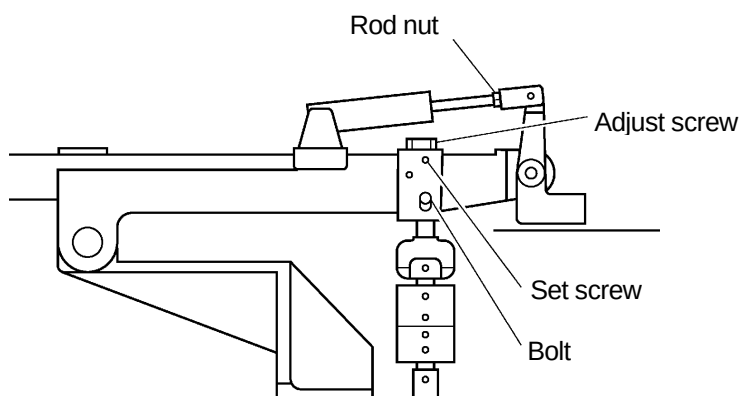
B. The pocket material or body strays when the center blade retracts from the pocket.

B-1. The center blade has burrs.

B-2. When the power is turned OFF, the clearance between the center blade bottom surface and the needle plate top surface is not correct. A small clearance moves the pocket material and the body simultaneously; a large one causes only the pocket material to stray backward.

Loosen the right and left bolts and the set screw, then adjust the center blade height by rotating the adjust screws. One turn raises or lowers the inner clamp lever by 1 mm, and raises or lowers the center blade by 2 mm. When the center blade is at its lowest position and lightly presses the body, make sure that some resistance can be felt in the front of the center blade.

The detailed adjustment procedures are described on "5-12. Adjusting the folding clamp".

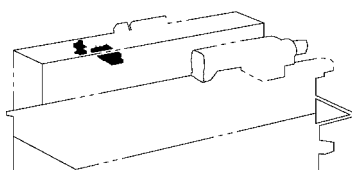


1828S

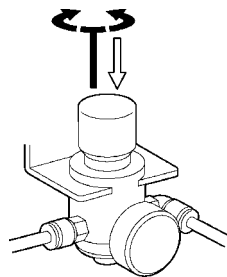
B-3. The sewing clamp assembly lightly presses the folded pocket, or descends slowly.

Remove valve cover. Set the pressure of the sewing clamp assembly to 0.15 - 0.20 MPa by adjusting the regulator in the figure on the left; excessively high pressure may make the material stray while the material is sewn or carried. Be sure to check that the pressure is proper by pressing the valves 4A and 4B alternately by hand.

When the sewing clamp assembly descends slowly, adjust the speed control of the valve 4A. If the assembly descends too early, the pocket material may be improperly folded in the flap margins.



1387S



1388S

B-4. The sponge attached underneath the sewing clamp assembly near the operator is improperly stuck.

C. Plate spring R and L in the center blade assembly and the inner clamp blades in the inner clamp assembly are improperly attached.

D. Program defect

Reprogram to shift the programmed pattern in parallel when the seam deviation is small.

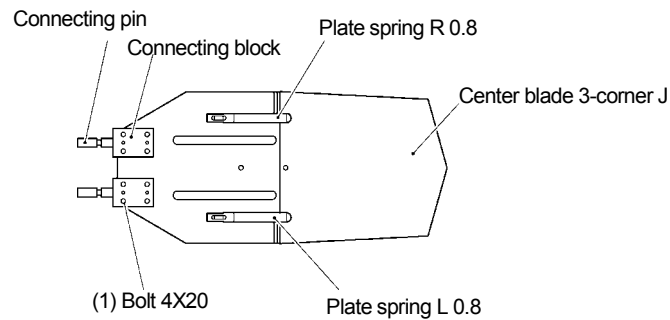
2. Seam deviates up in parallel (reverse case to 1).

<Cause>

A. The pocket material is improperly folded because the center blade is positioned above the correct position.

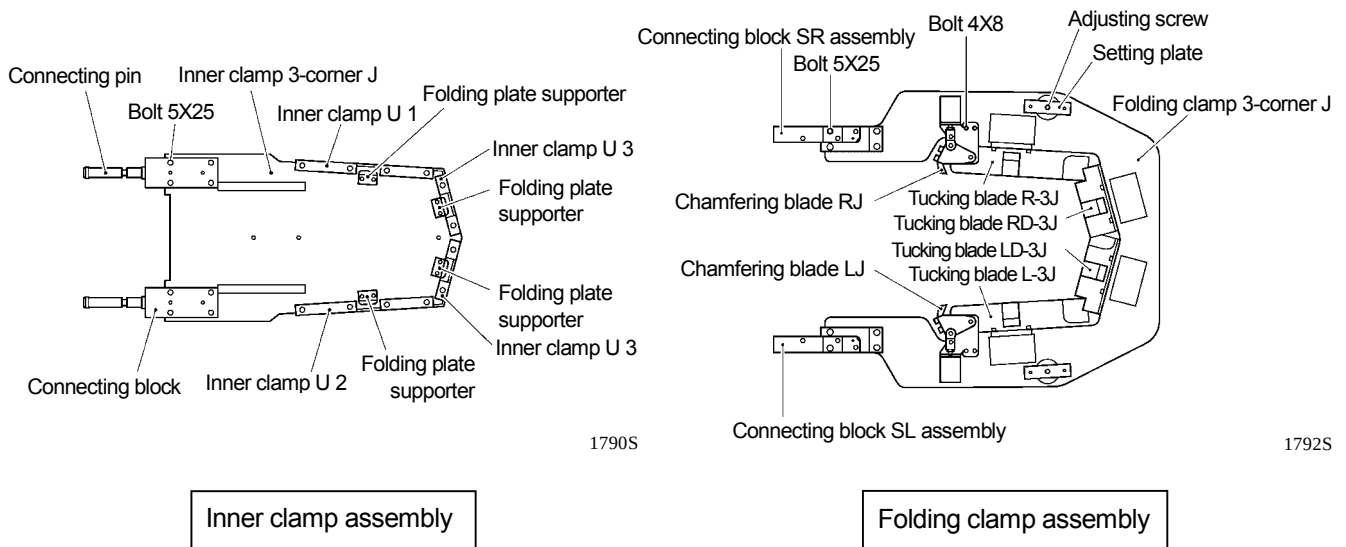
After loosening the eight bolts (1), shift the center blade backward in the loose holes of the connecting blocks (center blade), then fasten the bolts (1).

At this time, the inner clamp assembly and the folding clamp assembly may need to be shifted backward simultaneously.



Center blade assembly

1789S



Inner clamp assembly

Folding clamp assembly

B. Plate spring R and L in the center blade and the inner clamp blades in the inner clamp assembly are improperly attached.

C. Program defect.

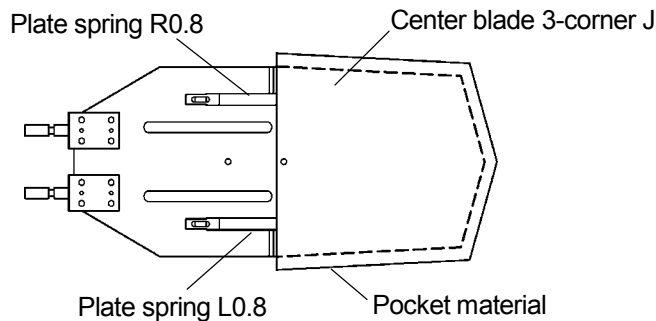
Reprogram to shift the programmed pattern in parallel when the seam deviation is small.

3. The seam margin at the pocket top is different.

<Cause>

A. The pocket material is improperly set.

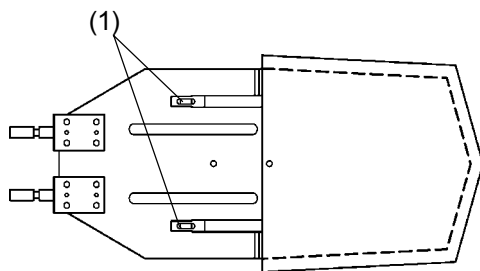
Set the pocket material correctly up to plate spring R and L.



1829S

B. Plate spring R and L are improperly adjusted.

Adjust the plate spring positions by loosening their two screws (1). At this time, the plate spring must be centered in the grooves of the center blade.



1829S

C. The pressure of plate spring R and L are too high.

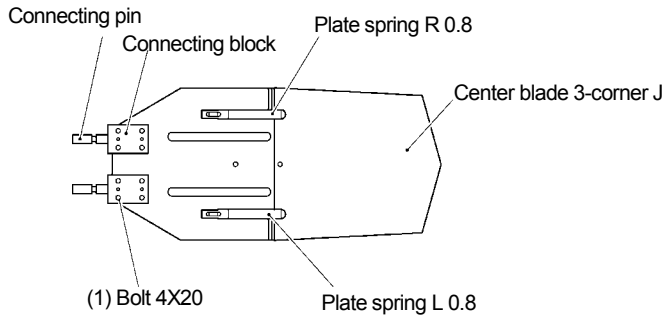
Bend the plate spring upward to decrease the spring pressure.

4. Seam deviates to the left in parallel.

<Cause>

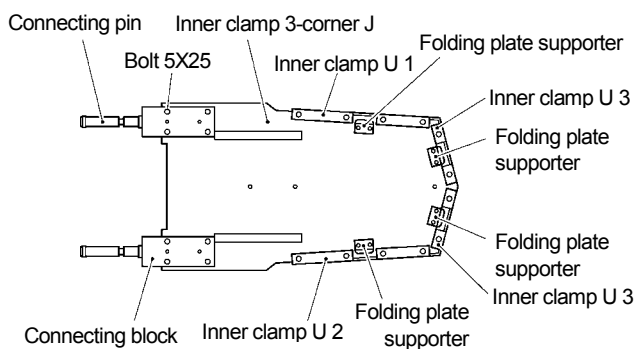
A. The pocket material is improperly folded because the center blade is attached to the right of the correct position.

After loosening the eight bolts (1), shift the center blade to the left in the loose holes of the connecting blocks (center blade), then fasten the bolts (1). At this time, the inner clamp assembly and the folding clamp assembly might need to be shifted to the left simultaneously.



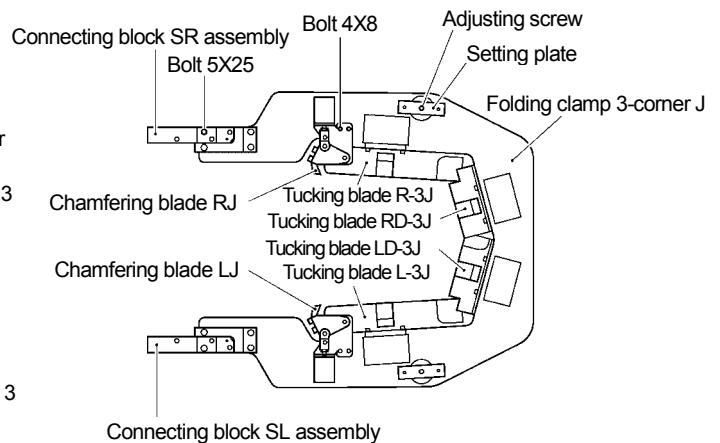
Center blade assembly

1789S



Inner clamp assembly

1790S



Folding clamp assembly

1792S

B. Program defect

Reprogram to shift the programmed pattern in parallel when the seam deviation is small.

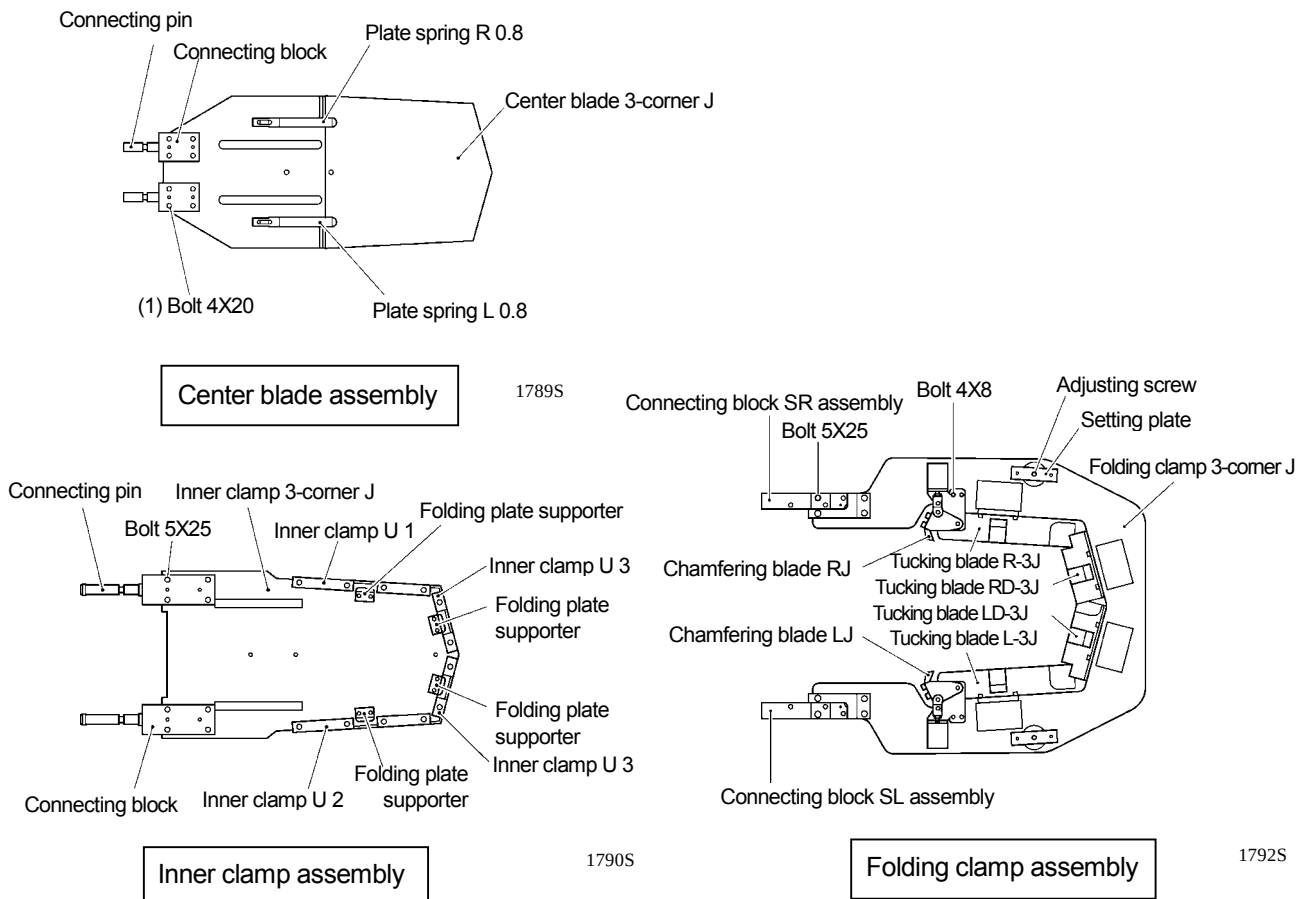
5. Seam deviates to the right in parallel.

<Cause>

A. The pocket material is improperly folded because the center blade is attached to the right of the correct position.

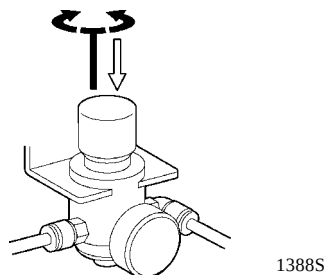
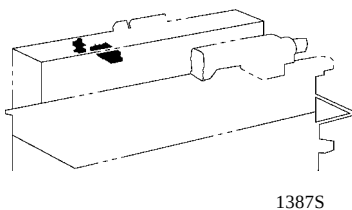
After loosening the eight bolts (1), shift the center blade to the right in the loose holes of the connecting blocks (center blade), then fasten the bolts (1).

At this time, the inner clamp assembly and the folding clamp assembly might need to be shifted to the right simultaneously.



B. The body strays to the left while the sewing clamp assembly is moving.

- If the needle plate has burrs, remove the burrs and buff the needle groove of the needle plate. Level the steps on both sides of the needle groove of the needle plate.
- Remove valve cover. Set the pressure of the sewing clamp assembly to 0.15 - 0.20 MPa by adjusting the regulator in the figure on the left; excessively high pressure might make the material stray while the material is sewn or carried. Be sure to check that the pressure is proper by pressing the valves 4A and 4B alternately by hand.



C. Program defect

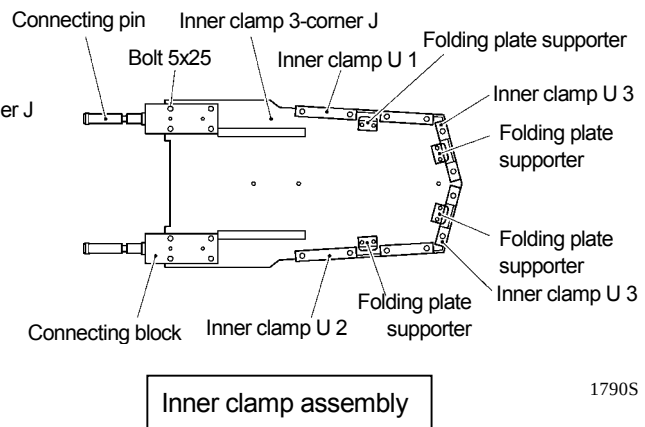
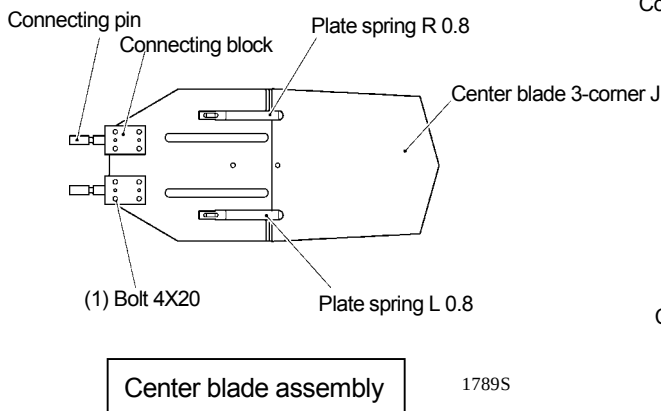
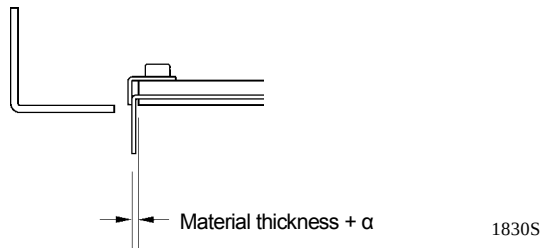
Reprogram to shift the programmed pattern in parallel when the seam deviation is small.

6. Partial seam deviates in parallel.

<Cause>

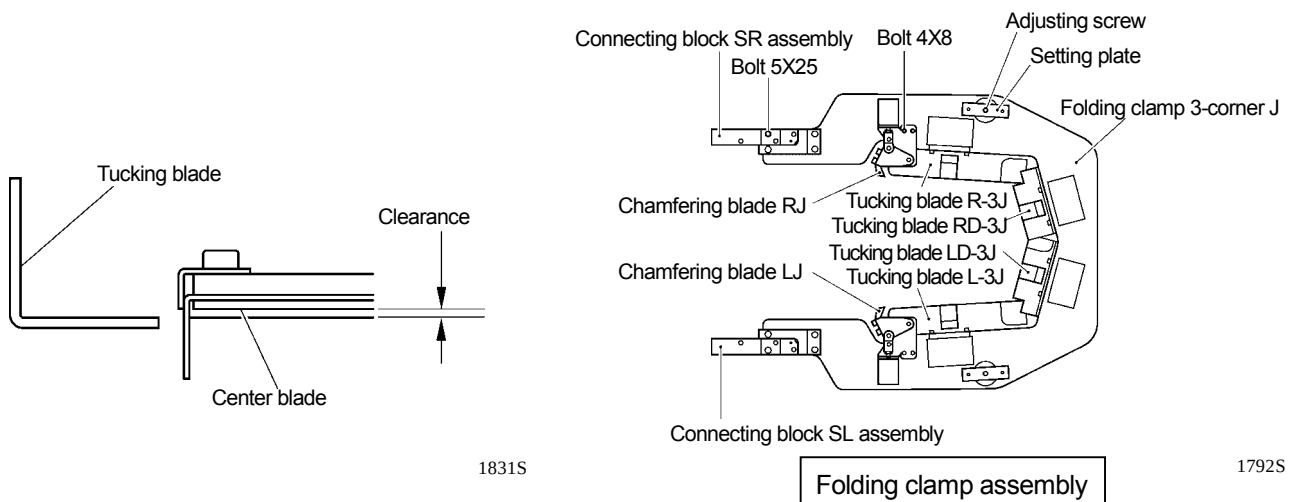
A. The inner clamp blades are improperly positioned.

- The seam margin is large.
This happens when the clearance between the center blade edge and the inner clamp blades is too small or too large, or when the inner clamp blades strike the center blade. Adjust the clearance width to the pocket material thickness + α , as shown in the figure on the left.
- The seam margin is small.
Increase the clearance between the center blade edge and the inner clamp blades.



B. The clearance between tucking blades R, L, RD and LD of the folding clamp assembly and the center blade.

- The seam margin is large.
Reduce the clearance between the tucking blades and the center blade.
At this time, be sure not to move the tucking blades back and forth or side to side.
- The seam margin is small.
Enlarge the clearance between the tucking blades and the center blade.
At this time, be sure not to move the tucking blades back and forth or side to side.



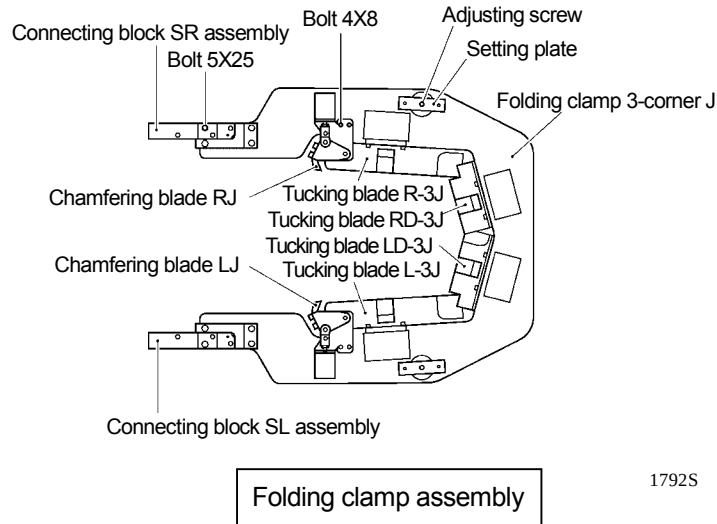
7. FOLDING MACHINE

C. Tucking blades R, L, RD and LD have burrs.

Remove the burrs and buff the tucking blades.

D. Because tucking blades R, L, RD and LD are attached below the correct position, the pocket material strays with the body when the tucking blades retract.

Raise and reattach the tucking blades. Be sure not to move the tucking blades back and forth or side to side.



E. Because the clearance between the center blade and the needle plate is small, the pocket material strays with the body when tucking blades R, L, RD and LD retract.

Refer to "Trouble 14. Cause D".

F. Program defect

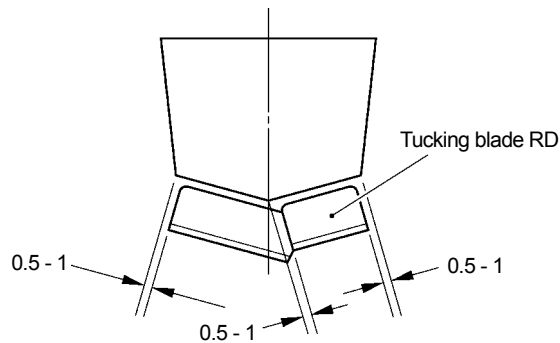
Reprogram partially.

7. The stitch at the bottom corner is not aligned with the center line of the folded pocket.

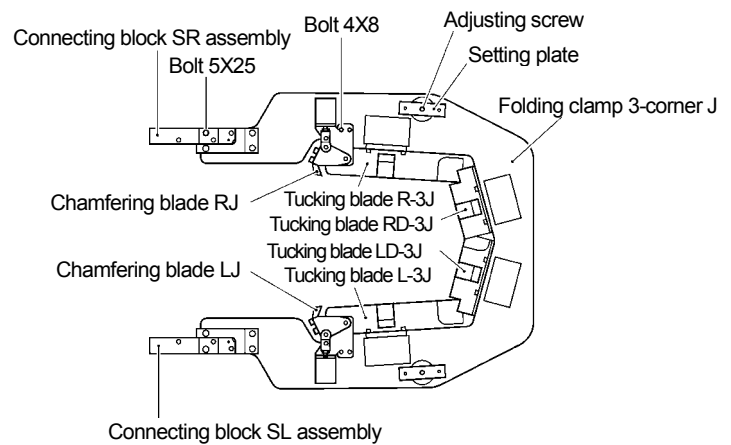
<Cause>

A. The left edge of tucking blade RD is off to the left.

Set the clearance between the center blade top and tucking blade RD left edge to 0.5 - 1 mm, as shown in the figure on the left.



1832S



Folding clamp assembly

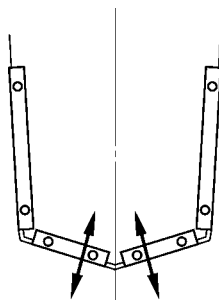
1792S

B. The right edge of tucking blade LD has burrs.

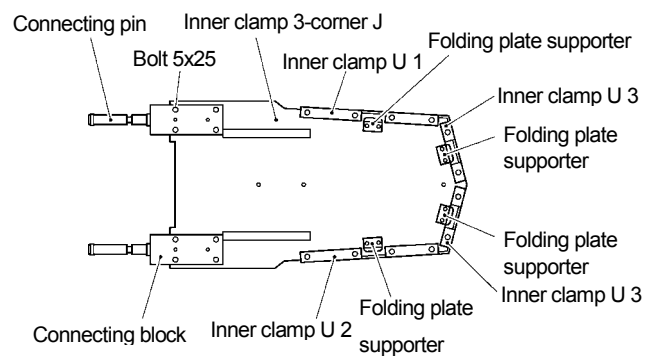
Remove the burrs and buff tucking blade LD.

C. The inner clamp blades are improperly adjusted.

Loosen the screws of the inner clamp blades, then adjust the two inner clamp blades, as shown in the figure on the left.



1833S



Inner clamp assembly

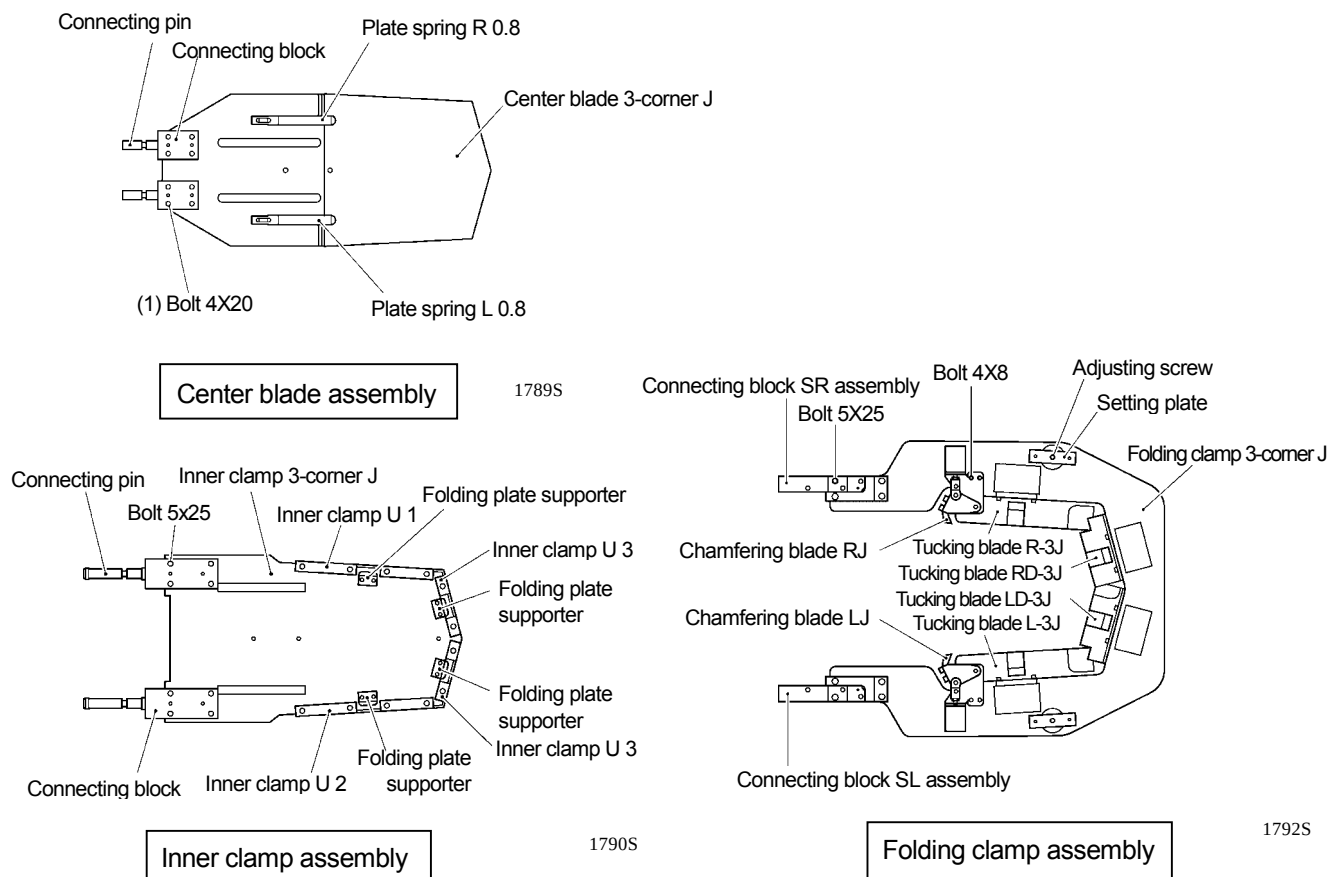
1790S

D. Program defect

Reprogram partially.

7. FOLDING MACHINE

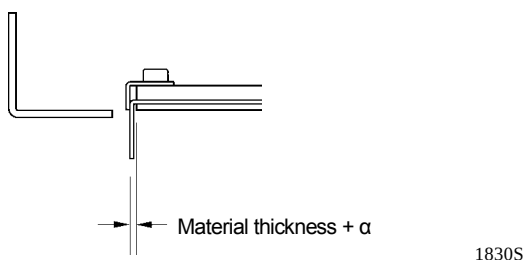
8. The seam margin at the bottom is large.



<Cause>

A. The inner clamp blades are improperly adjusted.

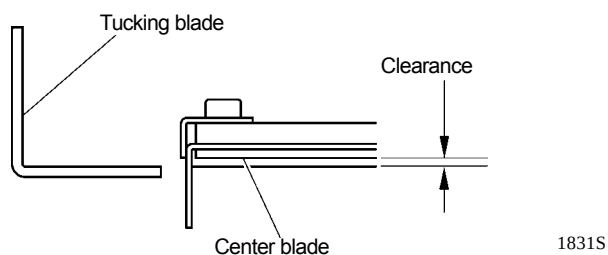
After loosening the inner clamp blade attaching screws, adjust the clearance between the center blade edge and the inner clamp blades. If the clearance is large, refer to "Trouble 6. Cause A".



B. Tucking blades LD and RD are improperly adjusted.

Adjust the clearance between the tucking blades and the center bottom surface.

At this time, be sure not to slide the tucking blades side to side. A large clearance increases the seam margin at the bottom, a small clearance decreases the seam margin at the bottom.



C. Tucking blades LD and RD have burrs at the place corresponding to the pocket trouble.

Remove the burrs and buff. At this time, be sure not to slide the tucking blades side to side.

D. There is no clearance between tucking blades LD and RD.

Adjust the clearance so that it is about the same thickness as a piece of pocket material.

E. Program defect

Reprogram partially

7. FOLDING MACHINE

9. The seam margin at one side of the bottom is large.

<Cause>

A. The inner clamp blades are improperly adjusted.

Refer to "Trouble 6. Cause A".

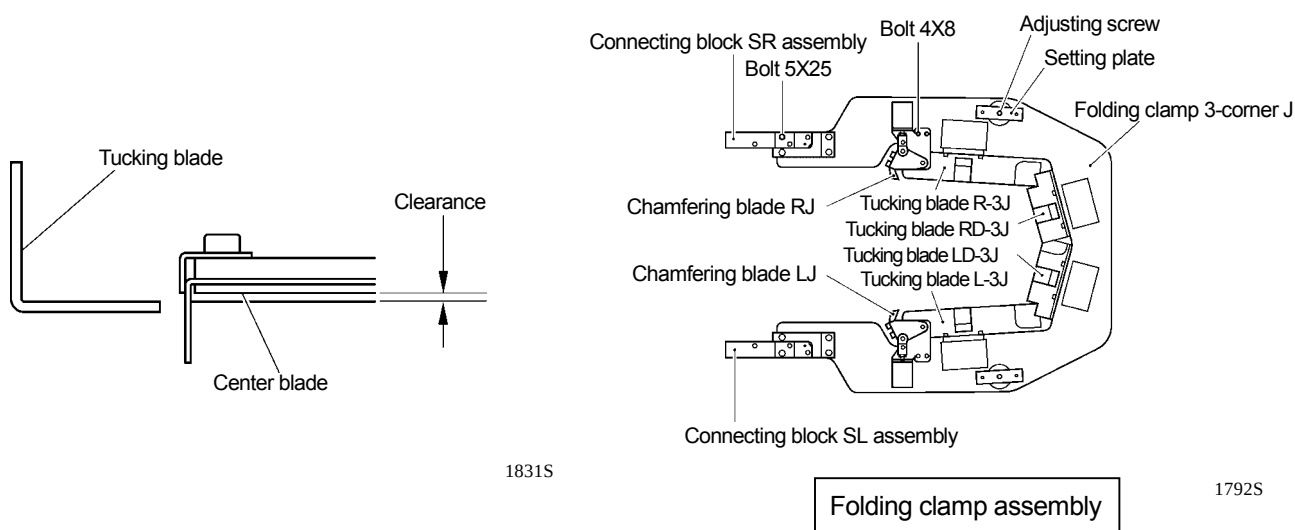
B. Tucking blades LD or RD has burrs at the place corresponding to the pocket trouble.

Remove the burrs and buff the tucking blades. At this time, be sure not slide the tucking blade side to side.

C. The clearance between tucking blade LD and the center blade is improperly adjusted.

Because a large clearance increases the seam margin, loosen the two screws to reduce the clearance.

At this time, be sure not to slide tucking blade LD side to side.



D. Program defect

Reprogram partially.

10. The seam margin is too small at the corners on both sides.

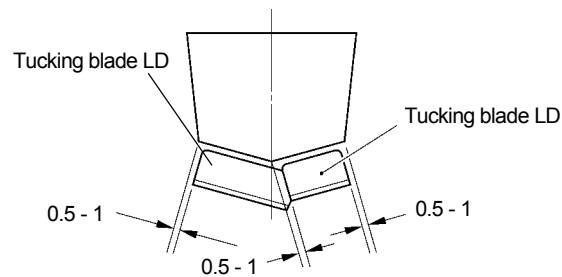
<Cause>

A. The inner clamp blades are improperly adjusted.

Refer to "Trouble 6. Cause A".

B. Tucking blades LD and RD are improperly adjusted.

Shift tucking blade LD slightly to the left to increase the seam margin on the left side. Shift tucking blade RD slightly to the right.



1832S

C. The clearance between tucking blades R and L and the center blade is improperly adjusted.

Refer to "Trouble 6. Cause B".

D. Program defect

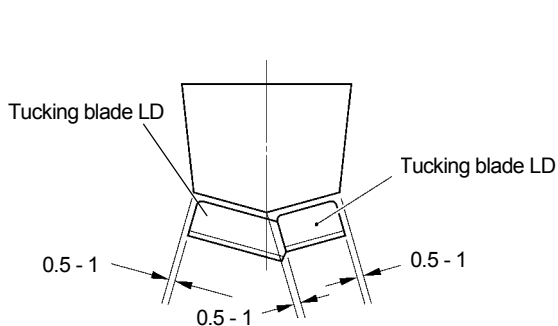
Reprogram partially.

11. The folded lone at the bottom corner is round.

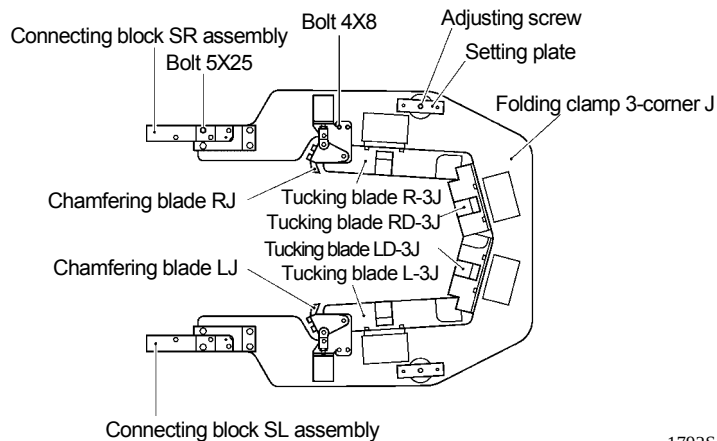
<Cause>

A. Tucking blades LD and RD are improperly adjusted.

If this is caused by tucking blade RD being off to the left, refer to "Trouble 7. Cause A".



1832S



1792S

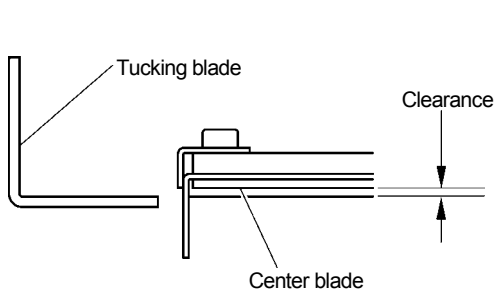
Folding clamp assembly

B. There is no clearance between tucking blade LD and RD.

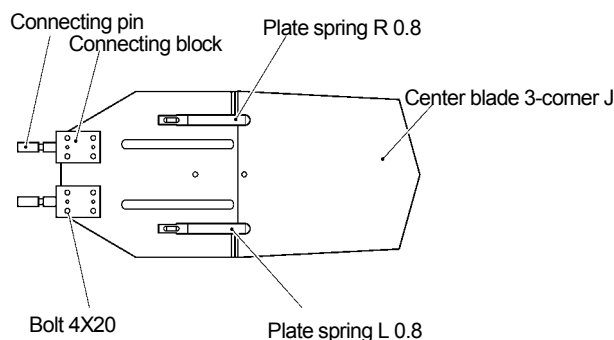
Adjust the clearance so that it is about the same thickness as a piece of pocket material.

C. The clearance between tucking blades LD and RD and the center blade is improperly adjusted.

The pocket material is chafed because the clearance between the tucking blades and the center blade might not be large enough. Adjust the clearances between each of them to the pocket material thickness + α .



1831S



1789S

Center blade assembly

D. The center blade corner is broken.

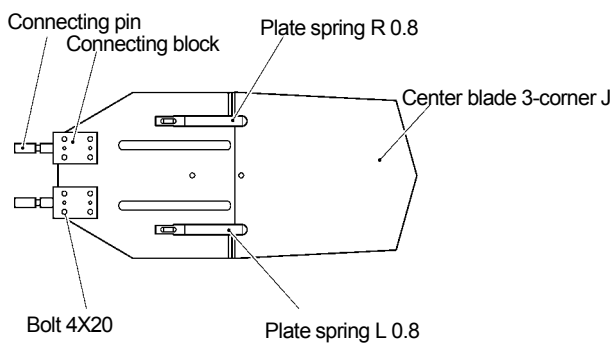
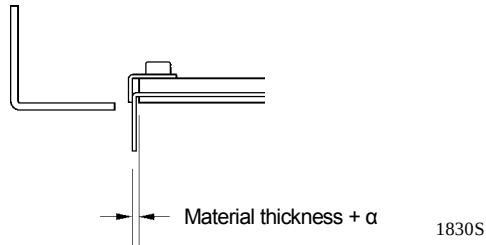
The broken center blade may need to be replaced.

12. The seam margin at the bottom is too small.

<Cause>

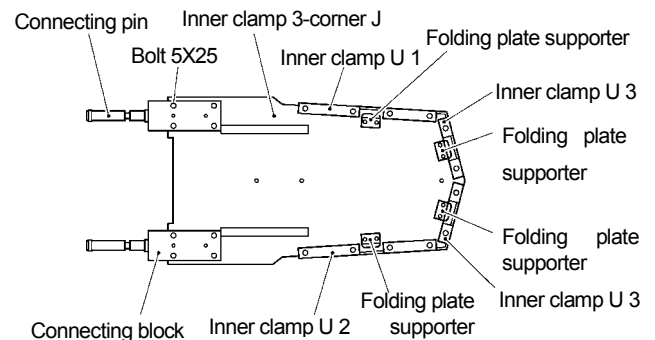
A. The inner clamp blades are improperly adjusted.

Slightly enlarge the clearance between the center blade edge and the inner clamp blades at the place corresponding to the pocket trouble. The clearance should be the material thickness + α .



Center blade assembly

1789S



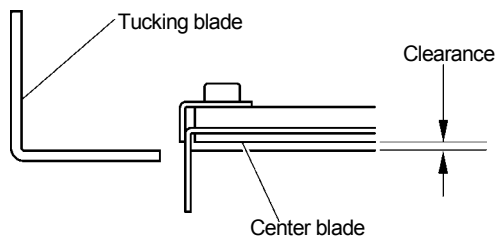
Inner clamp assembly

1790S

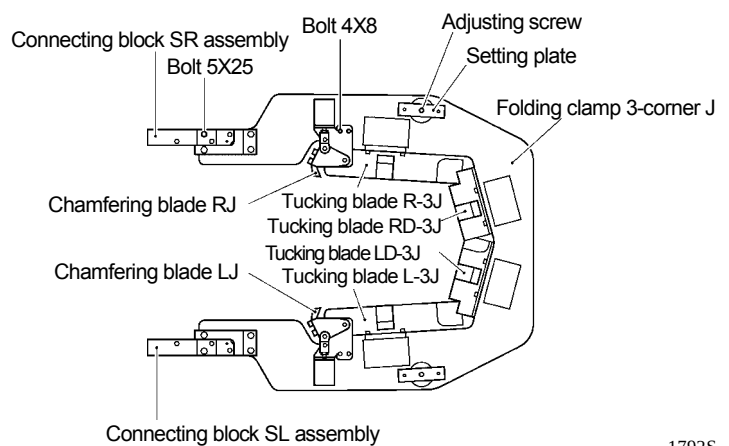
B. The clearance between tucking blade RD and LD is improperly adjusted.

Slightly enlarge the clearance between these tucking blades and the center blade at the place corresponding to the pocket trouble.

At the time, be sure not to move the tucking blades back and forth.



1831S



Folding clamp assembly

1792S

C. Program defect

Reprogram partially.

13. The pocket outline is curved.

<Cause>

A. The flap margin is small.

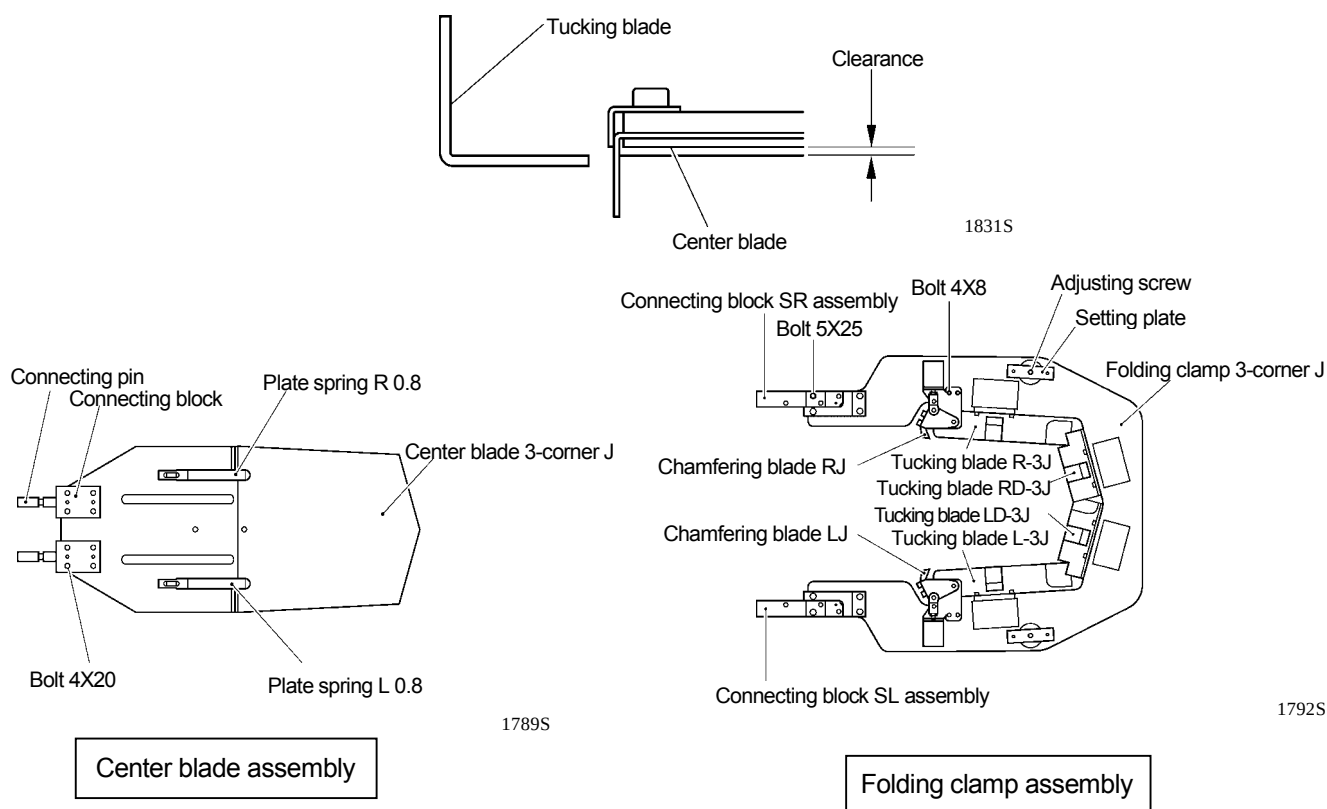
Make the flap margin at least 8 mm.

B. The tucking blades have burrs.

Remove the burrs and buff the tucking blades.

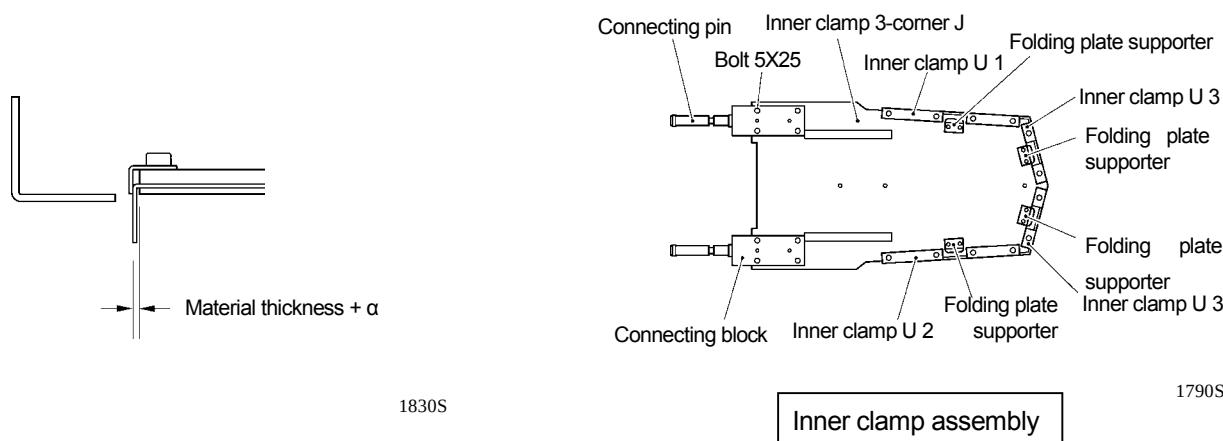
C. The clearance between the tucking blades of the folding clamp assembly and the center blade is improperly adjusted.

Reduce the clearance. At this time, be sure not to move the tucking blades back and forth or side to side.



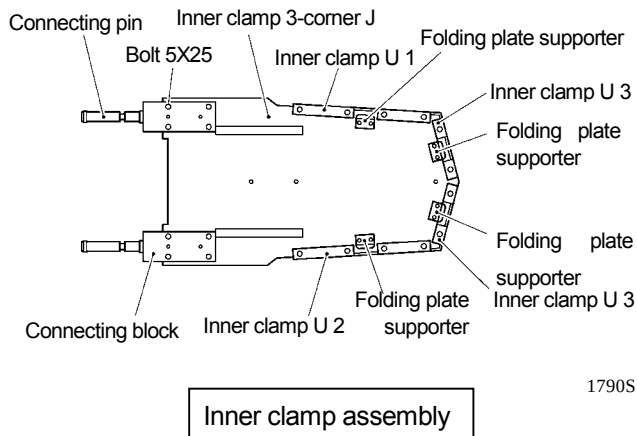
D. The inner clamp blades are improperly positioned.

This happens when the clearance between the center blade edge and the inner clamp blades is too small or too large, or when the inner clamp blades strike the center blade. Set the clearance width to the pocket material thickness + α , as shown in the figure on the left.

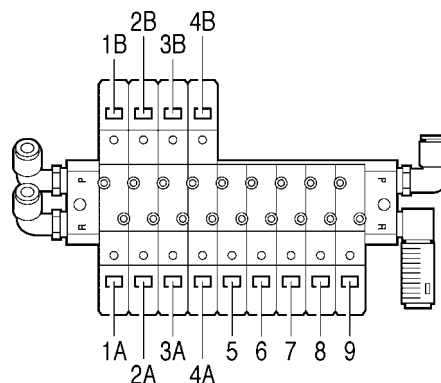


E. When the inner clamp assembly descends quickly, or excessively high pressure is applied to the pocket, or the material is fine, the outline is curved because the air is pressed out to the side of the pocket.

To adjust the inner clamp descending speed, remove the valve cover, then rotate clockwise the speed controller of the valve 4A. The too slow speed results in "Trouble 1". To decrease the pressure, refer to "Trouble 1. Cause B-3".



1790S

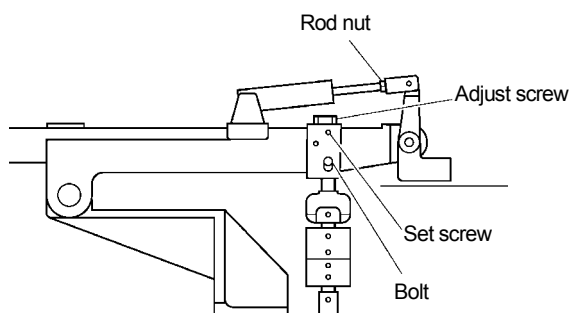


1354S

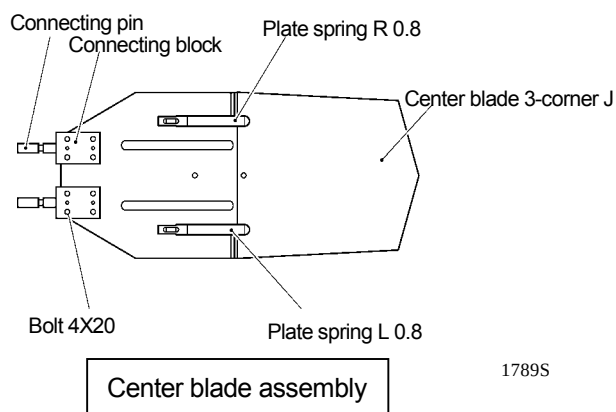
F. When the center blade is at its lowest position, the folded part of the pocket gradually returns to its original position while waiting because of the large clearance between the center blade and the needle plate.

Loosen the bolts on both sides and the set screw, then adjust the center blade height by rotating the adjust screws. One rotation raises or lowers the inner clamp lever by 1 mm, and raises or lowers the center blade by approximately 2 mm. When the center blade is at its lowest position and lightly presses the body, make sure that there is some tension in front of the center blade.

The detailed adjustment procedures are described on "5-12. Adjusting the folding clamp".



1828S



1789S

G. Program defect

If the trouble is not solved by the adjustments above, reprogram partially.

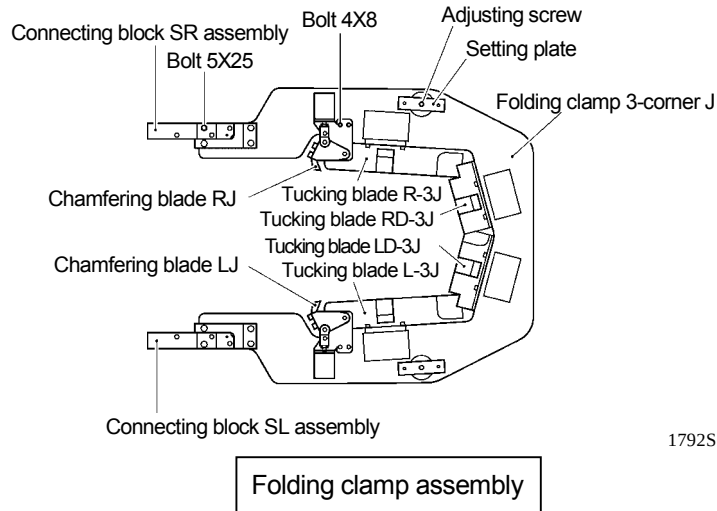
14. The pocket opening is wide.

<Cause>

A. When the chamfering blades are attached below the correct position, the body and the pocket stray when the chamfering blades retract.

Move upward and reattach the chamfering blades.

At this time, set the clearance between these chamfering blades and tucking blade L to about the material thickness.



1792S

B. When the chamfering blades are attached above the correct position, the body does not stray but the pocket strays.

Slightly lower the chamfering blades and the pocket opening part of tucking blade L. Be sure not to lower them too much, which results in "Cause A".

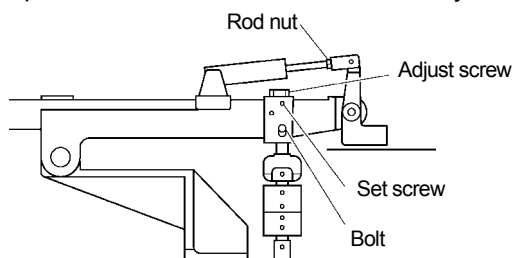
C. Tucking blade L has burrs.

Remove the burrs and buff the tucking blade.

D. The clearance between the center blade and the needle plate is small.

Loosen the bolts on both sides and the set screw, then adjust the center blade height by rotating the adjust screw. One turn raises or lowers the inner clamp lever by 1.25 mm, and raises or lowers the center blade by approximately 2 mm. When the center blade is at its lowest position and lightly presses the body, make sure that some resistance can be felt in the front of the center blade.

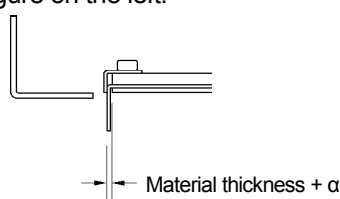
The detailed adjustment procedures are described on "5-12. Adjusting the folding clamp".



1828S

E. The inner blades are improperly adjusted.

This is caused by the clearance between the center blade edge and the inner clamp blade being too large or too small, or when the inner clamp blades strike the center blade. Set the clearance width to the pocket material thickness + α , as shown in the figure on the left.



1830S

F. Program defect

Reprogram partially.

15. The pocket opening is not tucked in.

<Cause>

A. The flap margin is small.

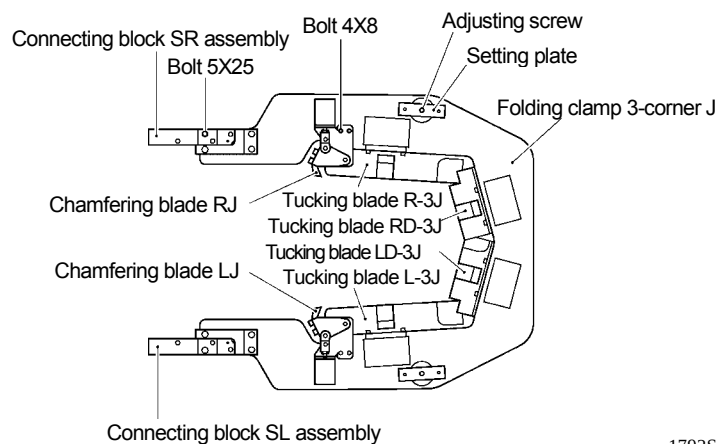
Make the flap margin at least 15 mm.

B. Tucking blade L and R are improperly attached.

Slide the tucking blades forward. If this adjustment is not enough to solve the trouble, enlarge the chamfered parts of the tucking blades by machining. At this time, remove the burrs and buff the blades.

C. Because the chamfering blades are improperly positioned, the pocket material is pressed out when the chamfering blades go to the pocket material.

Shift the chamfering blades or the whole chamfering mechanism backward. Check that the chamfering blades go under the pocket material.



1792S

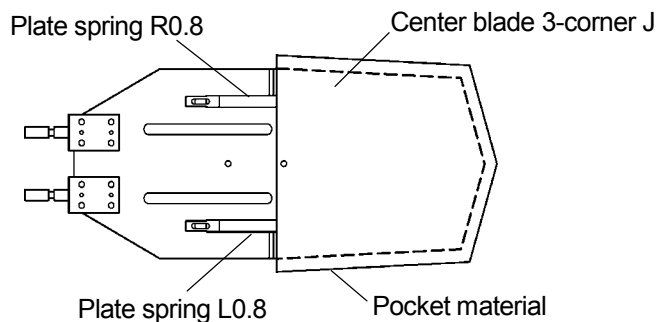
Folding clamp assembly

16. The flap margin at the pocket opening is out of the pocket.

<Cause>

A. The flap margin is large.

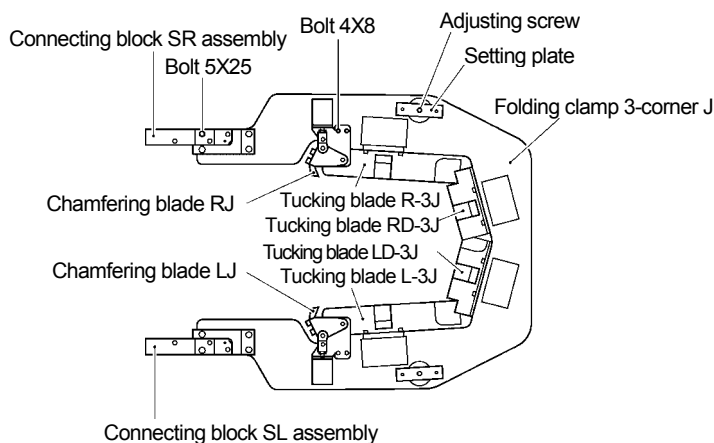
Set the pocket material onto the center blade so that the flap margin is even at every point. The proper length of the flap margin is 12-15 mm. When the flap margin is larger than usual, reduce it or refer to "Cause B" below.



1829S

B. The front-back positions of tucking blade L and R are improperly adjusted.

Shift the tucking blades backward.



1792S

Folding clamp assembly

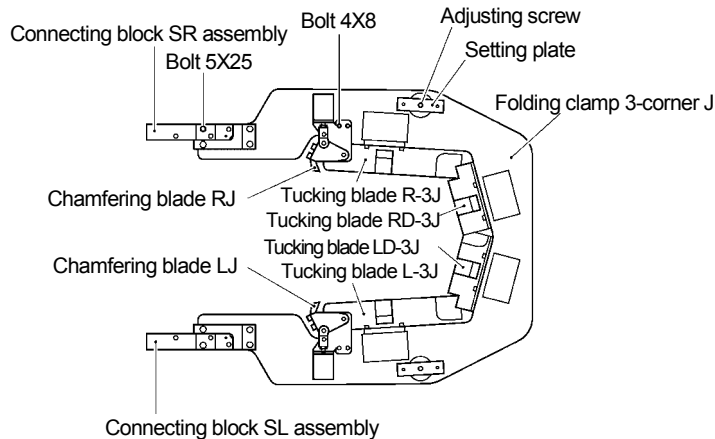
17. Material protrudes from the pocket opening.

<Cause>

A. Tucking blade L and R are improperly positioned.

Slide the tucking blades forward. If this adjustment is not enough to solve the problem, enlarge the chamfered parts of the tucking blades by machining.

At this time, remove the burrs and buff the blades. If you slide the blades forward too much, the same problems as described in “16. The flap margin at the pocket opening is out of the pocket.” will occur.



1792S

Folding clamp assembly

18. The pocket pattern is not aligned with the body pattern (when the pattern is vertical).

<Cause>

A. The pocket and the body are improperly positioned.

Position them correctly in mode pattern matching.

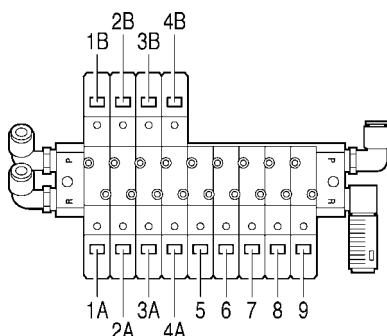
B. The pattern pitch of the pocket is different from that of the body.

Check both pitches on a level surface.

C. The inner clamp assembly or the sewing clamp assembly descends quickly.

If the inner clamp assembly descends quickly: Check whether the pattern is aligned or not when the folded pocket is waiting. To adjust the descending speed, remove valve cover, then slowly press the speed controller of the valve 2A. At the same time, the cylinder air cushion near the rod may need to be loosened slightly.

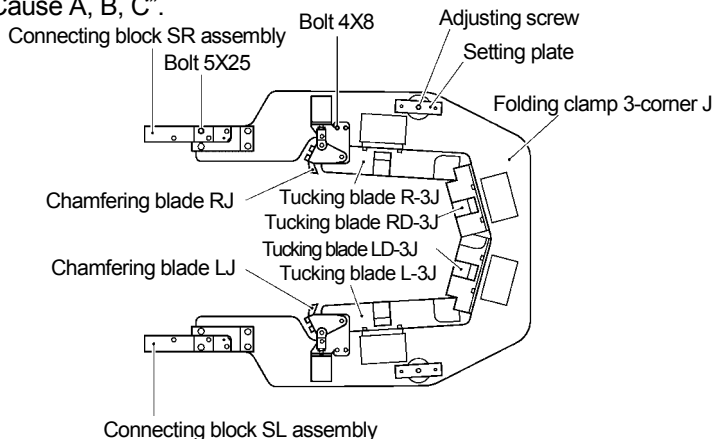
If the sewing clamp assembly descends quickly: Refer to "Trouble 13. Cause E".



1354S

D. Because the chamfering blades or tucking blades are attached below the correct position or because the clearance between the center blade and the needle plate is small, the body strays when the chamfering blades or tucking blades retract.

Refer to "Trouble 14. Cause A, B, C".

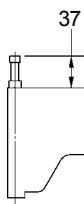


1792S

Folding clamp assembly

E. The body is caught by the needle plate long groove and strayed to the left during sewing.

- If the sewing clamp pressure is high: Refer to "Trouble 5. Cause B".
- If the presser foot pressure is high: Adjust the presser foot height to approximately 37 mm.
- Remove the burrs in the groove and buff it. If one side of the groove is higher than the other side, remove the needle plate then make the two sides level.



1834S

19. The pocket pattern is not aligned with the body pattern (when the pattern is horizontal).

<Cause>

A. The pocket and the body are improperly positioned.

Position them correctly in mode pattern matching.

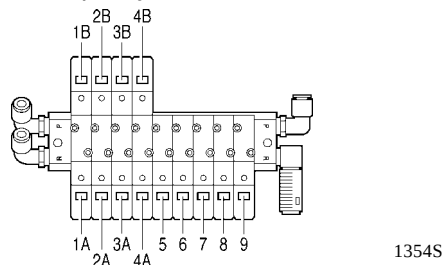
B. The pattern pitch of the pocket is different from that of the body.

Check both pitches on a level surface.

C. The inner clamp assembly or the sewing clamp assembly descends quickly.

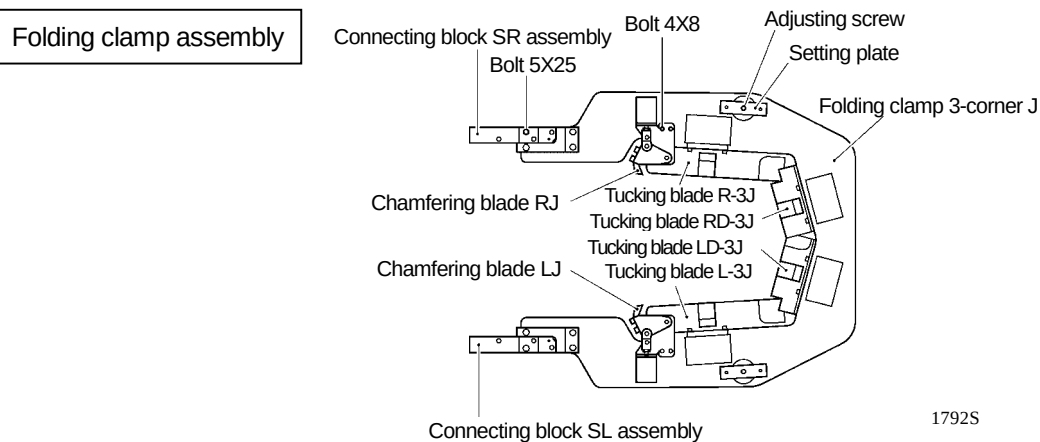
If the inner clamp assembly descends quickly: Check whether the pattern is aligned or not when the folded pocket is waiting. To adjust the descending speed, remove valve cover, then slowly press the speed controller of the valve 2A. At the same time, the cylinder air cushion near the rod may need to be loosened slightly.

If the sewing clamp assembly descends quickly: Refer to "Trouble 13. Cause E".



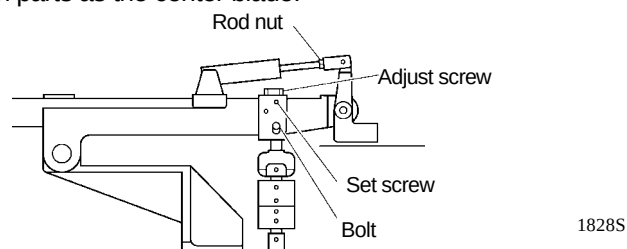
D. Because tucking blade LD and RD are attached below the correct positions or because the clearance between the center blade and the needle plate is small, the body strays when the tucking blades retract.

- Raise the tucking blades taking care not to shift them side to side.
- If the clearance between the center blade and the needle plate is small: Refer to "Trouble 14. Cause C".



E. Because the folding clamp assembly is not parallel to the needle plate and the center blade leans towards the operator, the body strays forward when the folding clamp assembly descends.

After loosening the two nuts at the top of the two cylinder rods which drive the folding clamp assembly, rotate the cylinder rods so that the folding clamp assembly and the needle plate are parallel. At this time, check that the tucking blades do not strike such parts as the center blade.



F. When the center blade retracts from the pocket, the pocket material or the body strays backward.

Refer to "Trouble 1. Cause B".

20. The needle location at the corners is improper.

<Cause>

The inertia of the X-Y movement mechanism results in improper needle location, which is different from the programmed points. (Note: The machine motor rotating speed may vary the needle location at each corner.)

To prevent uneven stitching at the corners, the machine can make stitching at the corners at low speed.

Refer to the instruction manual for programmer.

Reprogram to change the needle location 2-3 stitches before the corner in the program. Changing the needle location for only 1 stitch makes the stitch vary in pitch.

21. The pocket top is narrow.

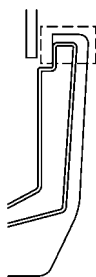
<Cause>

A. The inner clamp blades are improperly positioned.

Increase the clearance between the center blade edge and the inner clamp blades at the pocket top.

B. When the top edge of the pocket material is not clamped by the sewing clamp assembly, it strays and is sewn.

Affix the sponge to the inside of all the pocket edge of the sewing clamp while holding the pocket material with the sponge. If the needle strikes the sponge, thread breakage and stitch skipping may be caused.

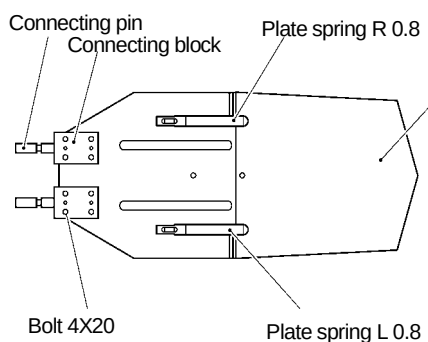


1835S

C. Program defect

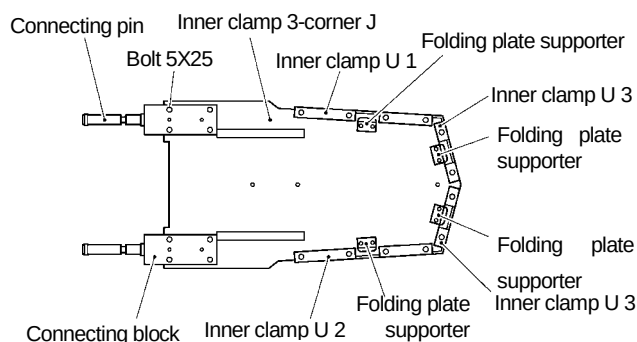
Reprogram to change the value to slightly inside the pocket top edge.

Note: The last way to widen the pocket top is to stick an auxiliary plate (such as a tape) on the top edge of the pocket's center blade. Avoid this method if possible because its durability is short.



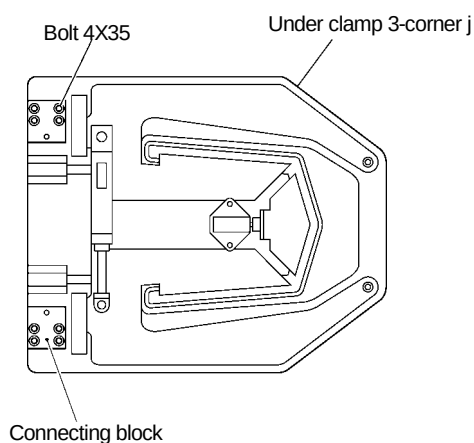
Center blade assembly

1789S



Inner clamp assembly

1790S



Sewing clamp assembly

1793S

22. The seam margin is large.

<Cause>

- A. Because the forward part of the center blade is curved up, the clearance between the needle plate and the center blade is large only at the forward part.**

Remove the center blade. Distort the center blade to level.

- B. The inner clamp blades are improperly attached.**

Refer to "Trouble 6. Cause A".

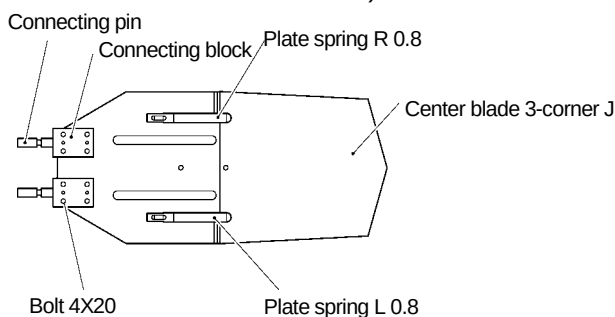
- C. Because the center blade assembly is attached too far forward, the pocket material is improperly folded.**

After loosening the eight bolts (1), shift the center blade backward in the loose holes of the connecting blocks (center blade), then fasten the bolts (1).

At this time, the inner clamp assembly and the folding clamp assembly might need to be shifted backward simultaneously.

In this case, loosen the four screws (2) and the two plate springs are taken out to the front.

(Only the part which shifted the whole center blade to the back)



Center blade assembly

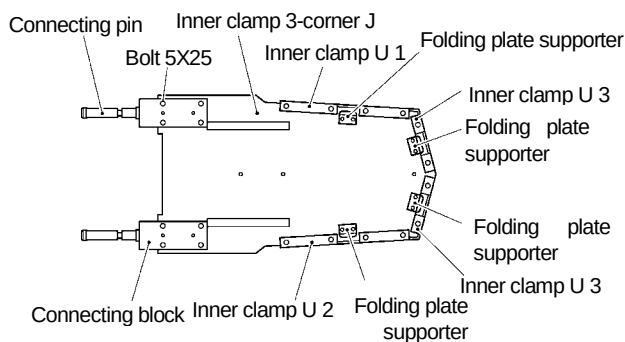
1789S

- D. The tucking blades have burrs.**

Remove the burrs and buff the tucking blades.

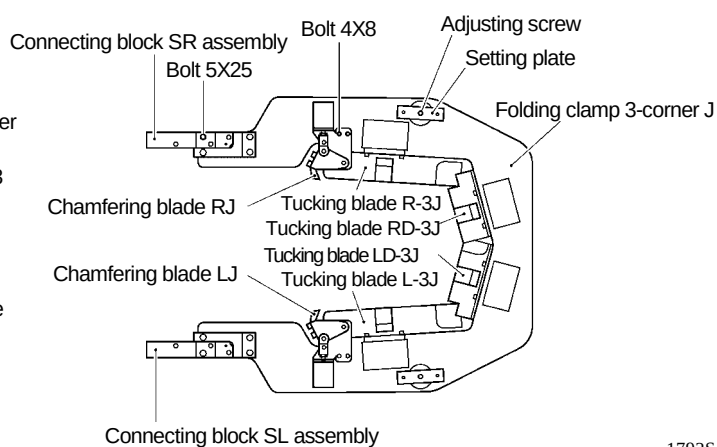
- E. Program defect**

Reprogram partially.



Inner clamp assembly

1790S



Folding clamp assembly

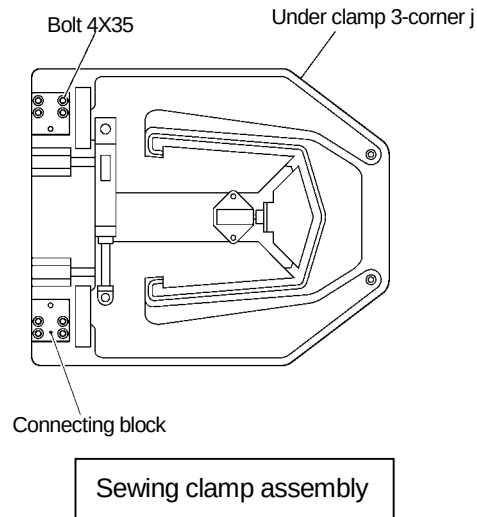
1792S

23. The pocket has skipped stitches at the sewing start.**<Cause>****A. The needle thread coming out of the needle is short.**

- Lengthen the thread in pretension.
- Check the opening amount between the tension discs.
- Perform reverse stitching 2-3 stitches after reprogramming.
- Adjust the thread blower so that it correctly blows the thread end.

B. The sewing clamp improperly presses the body and pocket materials.

Refer to "Trouble 21. Cause B".



1793S

24. The stitch pitch is uneven at the corners.

<Cause>

The inertia of the X-Y movement mechanism results in improper needle location, which is different from the programmed points.

(Note: The machine motor rotating speed may vary the needle location at each corner.)

To prevent uneven stitching at the corners, the machine can make stitching at the corners at low speed.

Refer to the instruction manual for programmer.

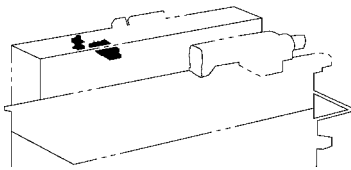
Find the proper needle location at the corners by reprogramming and sewing several times. The machine motor rotating speed may vary the best points to be programmed.

25. The pocket has skipped stitches or thread breakage at the pocket top.

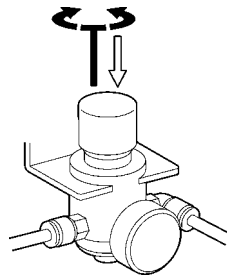
<Cause>

Because the sewing clamp improperly clamps the pocket top during sewing, the pocket material moves about.

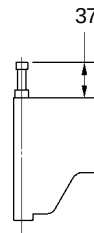
- Move the sponge as close as possible to the top edge of the pocket, then refer to "Trouble 21. Cause B".
- Increase the sewing clamp pressure referring to "Trouble 5. Cause B". Be sure not to increase the pressure excessively, which may result in vertical uneven material feeding or vertical gathering.
- Increase the presser foot pressure. Though the standard height of the presser foot is 37 mm, decrease the height slightly to increase the pressure. Be sure not to increase excessively, which may result in horizontal uneven material feeding or horizontal gathering.



1387S



1388S



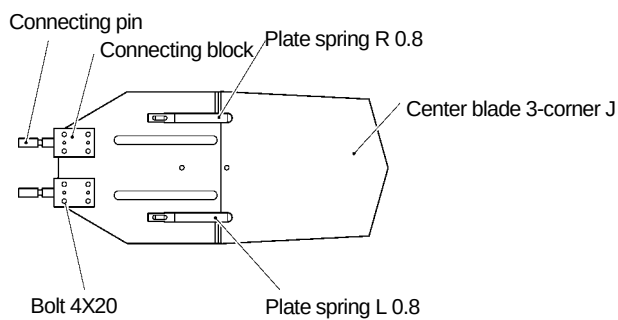
1834S

26. The seam margin is large. (Heavy material)

<Cause>

When the material is relatively thick, the shape of the sewn pocket is large

Refer to "Trouble 6.". If the adjustment in "Trouble 6." is not enough to solve this trouble, the center blade needs to be replaced by a smaller one. The standard center blade is 1.4 mm smaller on both sides than an actual pocket shape. When several sizes of center blades (for example, the 1.8 mm smaller one on both sides or the 2.2 mm smaller one on both sides) are available besides the standard one, almost all heavy material can be managed.



Center blade assembly

1789S

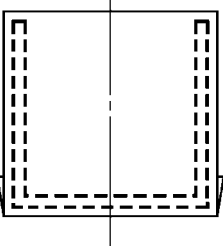
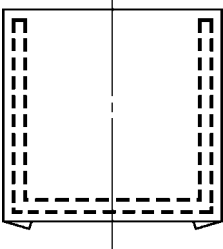
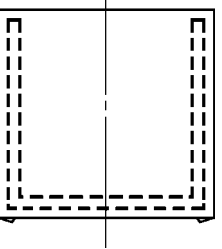
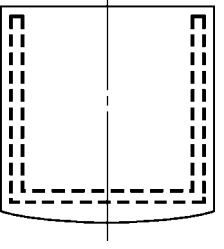
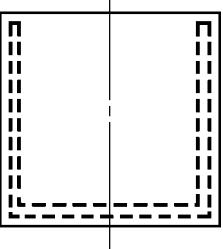
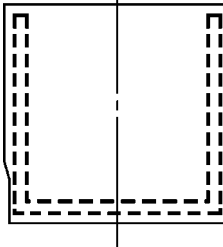
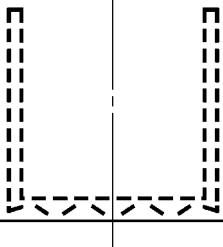
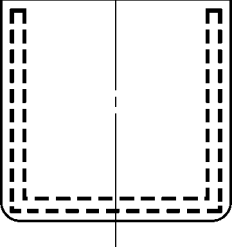
27. The distance between the inner row stitches and the outer row stitches is irregular.

<Cause>

The inertia of the X-Y movement mechanism results in needle location different to the programmed points.

Refer to the instruction manual for programmer.

7-4-3. Characteristic troubles of two corner pocket model

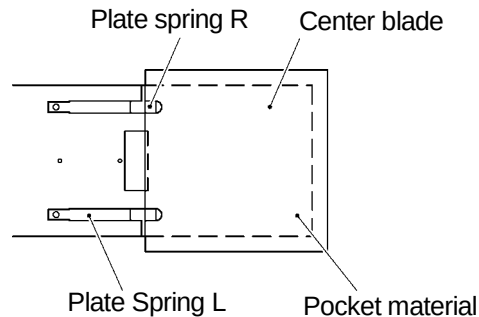
1. The tucked margins at the bottom protrude on both sides.  1836S	2. The flap margins at the bottom on both sides are not tucked in.  1837S	3. The tucked flap margins at the bottom protrude below.  1838S	4. The base is curved.  1839S	5. The tucking blades do not operate smoothly.  1840S
6. The bottom corners rise and the seam margins near the bottom on both sides are small.  1841S	7. The bottom seam is zigzag chain stitch.  1842S	8. The corners are round.  1843S		

1. The tucked margins at the bottom protrude on both sides.

<Cause>

A. The flap margin is too large.

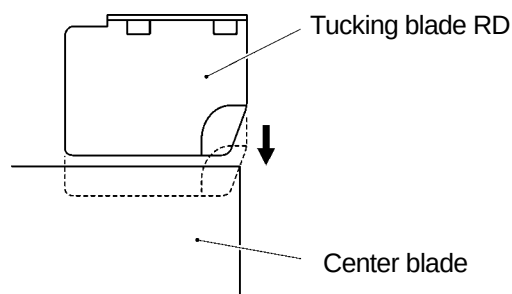
Set the pocket material onto the center blade so that the flap margin is even at each point. The proper length of the flap margin is 12-15 mm. If the flap margin is larger than it should be, reduce it.



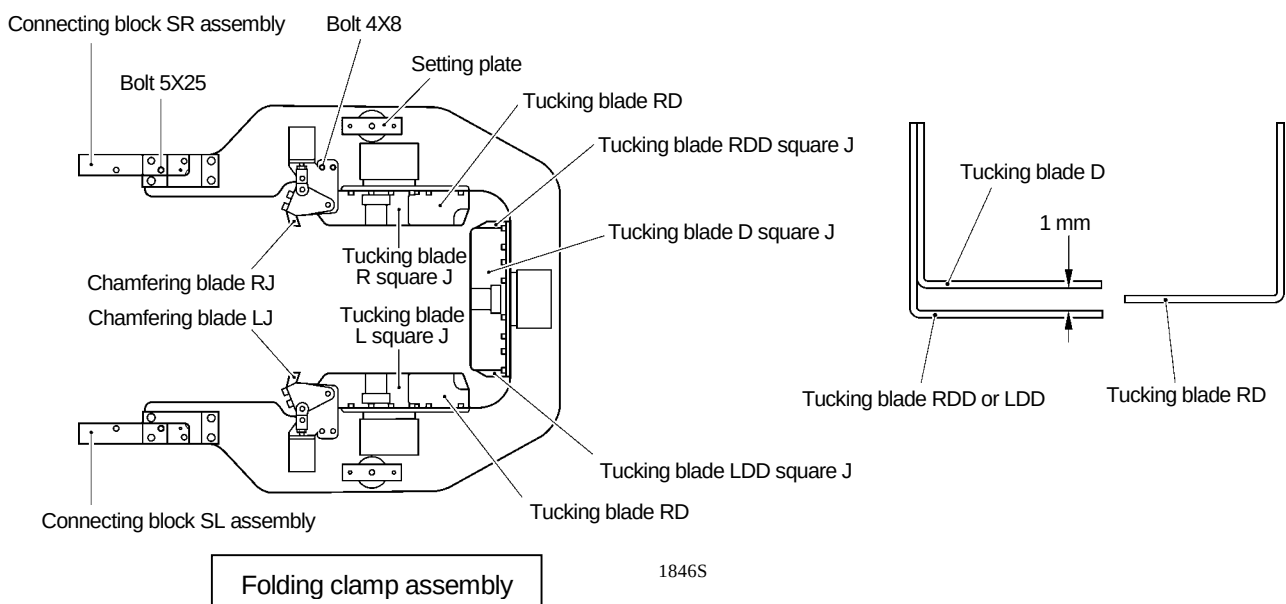
1844S

B. Tucking blade RD or LD is improperly positioned.

Shift the tucking blade forward, then adjust it so that its edge is aligned with the center blade corner when the cylinder driving the tucking blade works. (The alignment does not have to be perfect.) At this time, check that the tucking blades come into the clearance between the D and the RDD or LDD tucking blades.



1845S



1847S

Folding clamp assembly

1846S

2. The flap margins at the bottom on both sides are not tucked in.

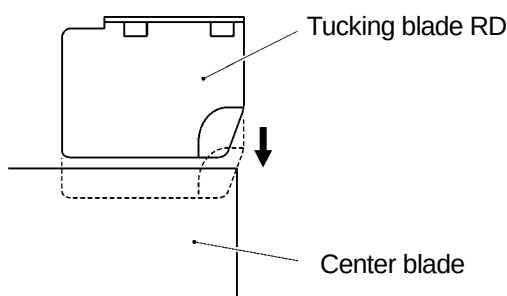
<Cause>

A. The flap margin on both sides are too small.

Adjust the flap margin to 12-15 mm.

B. Tucking blade RD or LD is improperly positioned.

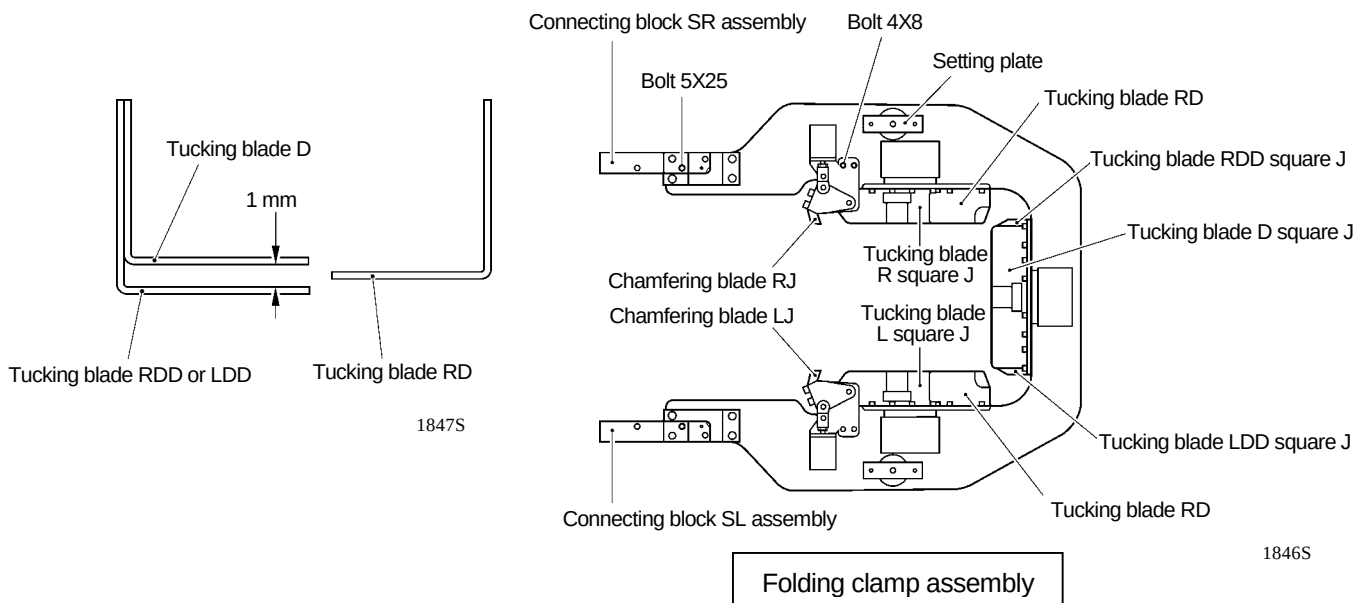
Shift the tucking blade backward, then adjust it so that its edge is aligned with the center blade corner when the cylinder driving the tucking blade works. (The alignment does not have to be perfect.) At this time, check that the tucking blades come into the clearance between the D and the RDD or LDD tucking blades.



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C. The height between tucking blade RD or LD and tucking blades D and RDD or LDD is improperly adjusted.

If tucking blade RD or LD is attached above tucking blade D or below tucking blade RDD or LDD, reattach tucking blade RD or LD, as shown in the figure on the left.



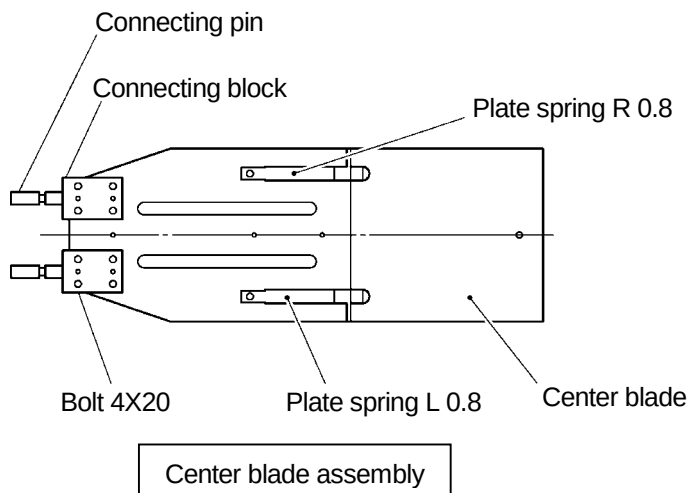
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3. The tucked flap margins at the bottom protrude below.

<Cause>

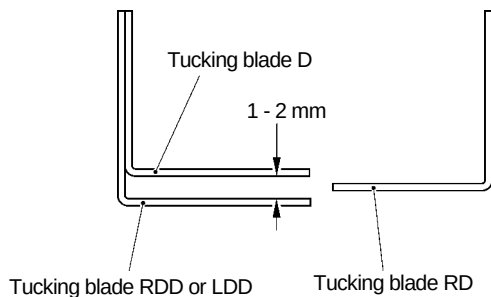
A. Tucking blade RD or LD is improperly positioned.

Refer to "Trouble 2. Cause B".



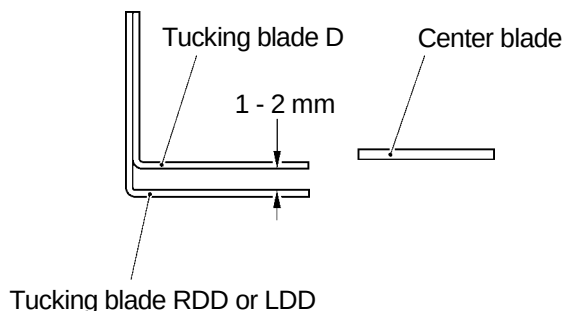
B. Because the clearance between tucking blade D and RDD or LDD is too small, the pocket material strays when they retract.

As shown in the figure on the left, adjust the clearance between tucking blade D and RDD or LDD to approximately 1-2 mm and also adjust these tucking blade height so that tucking blade RD and LD come into the center of the clearance.



C. Because tucking blade RDD or LDD is attached below the correct position, the body strays when the tucking blade retracts.

Raise the tucking blade and reattach it. At this time, adjust the clearance between tucking blade RDD or LDD and tucking blade D to approximately 1 mm.



4. The base is curved.

First, refer to "Trouble 13." of pentagon pocket.

The cause described below is characteristic of square pockets.

<Cause>

Because tucking blade RDD or LDD is attached below the correct position, the pocket material strays with the body when the tucking blade retracts.

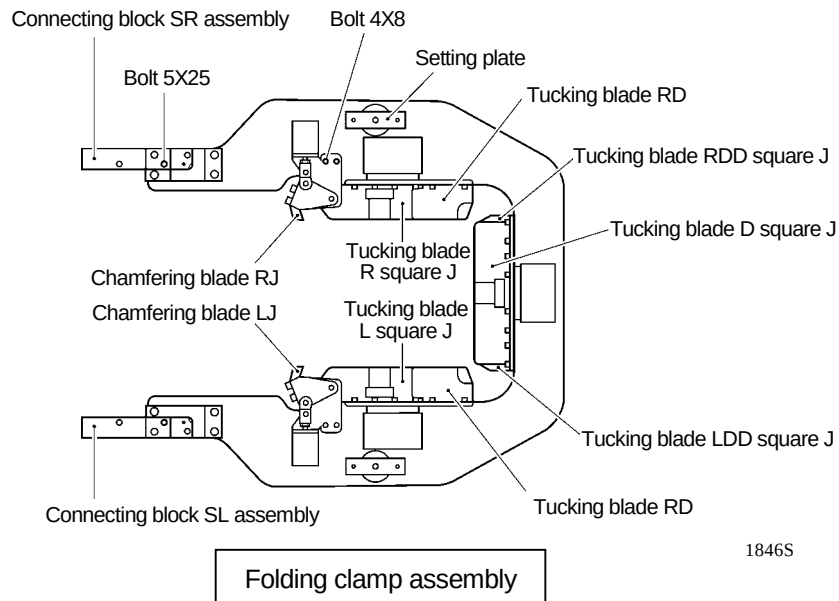
Raise the tucking blade and reattach it. Adjust the clearance between tucking blade RDD or LDD and tucking blade D to approximately 1-2 mm. At this time, make sure not to raise tucking blade D too much, which may cause it to hit the center blade, or cause the pocket material to stray when the tucking blade retracts.

5. The tucking blades do not operate smoothly.

<Cause>

Because tucking blade RDD or LDD is attached below the correct position, tucking blades RDD or LDD and D do not retract smoothly.

Adjust the clearance between these two tucking blades to approximately 1-2 mm. Then, holding the clearance width between tucking blades RD and LD, raise all of the tucking blades and reattach them. At this time, be sure not to shift them side to side. If they cannot be raised, attach a sponge (1 mm) onto the folding clamp assembly at the bottom surface near the operator.



7. FOLDING MACHINE

6. The bottom corners rise and the seam margins near the bottom on both sides are small.

<Cause>

A. When the crease of the flap margin is aligned with the needle location, the pocket is sewn improperly and the seam margin is small.

Shift tucking blades RD and LD forward and reattach to reduce the amount of margin to be tucked in.

B. The inner clamp blades are improperly attached.

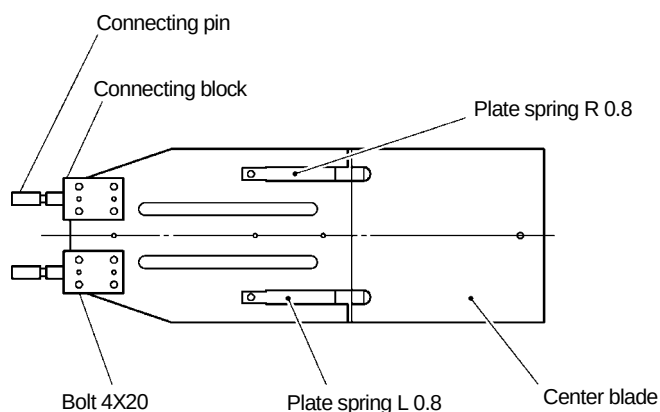
Slightly increase the clearance between the inner clamp blades and the center blade.

C. The clearance between tucking blades RD and LD of the folding clamp assembly and the center blade is improperly adjusted.

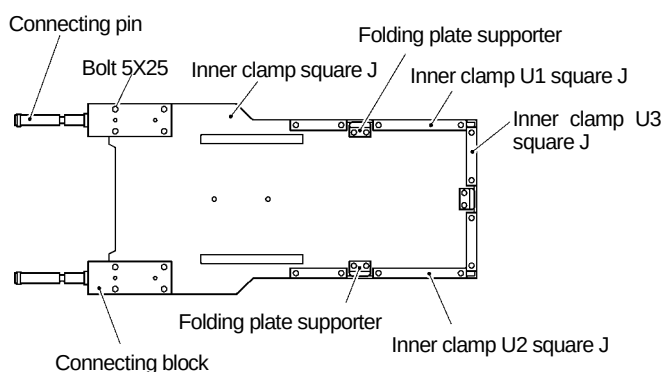
Increase the clearance. At this time, be sure not to move the tucking blades back and forth.

D. Program defect

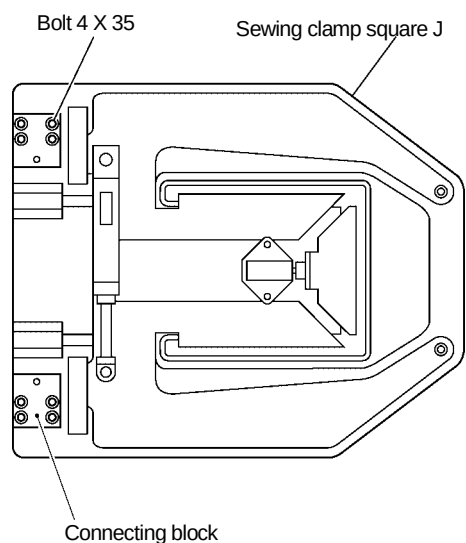
Reprogram partially.



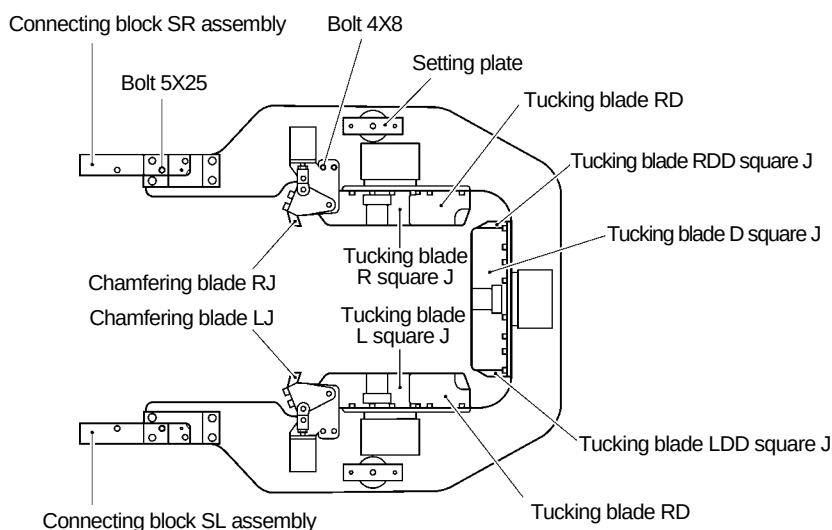
Center blade assembly



Inner clamp assembly



Sewing clamp assembly



Folding clamp assembly

7. The bottom seam is zigzag chain stitch.

<Cause>

The seam sewn from left to right almost aligns with the border line between the hitch stitch and perfect stitch. This problem happens when both of these stitches appear.

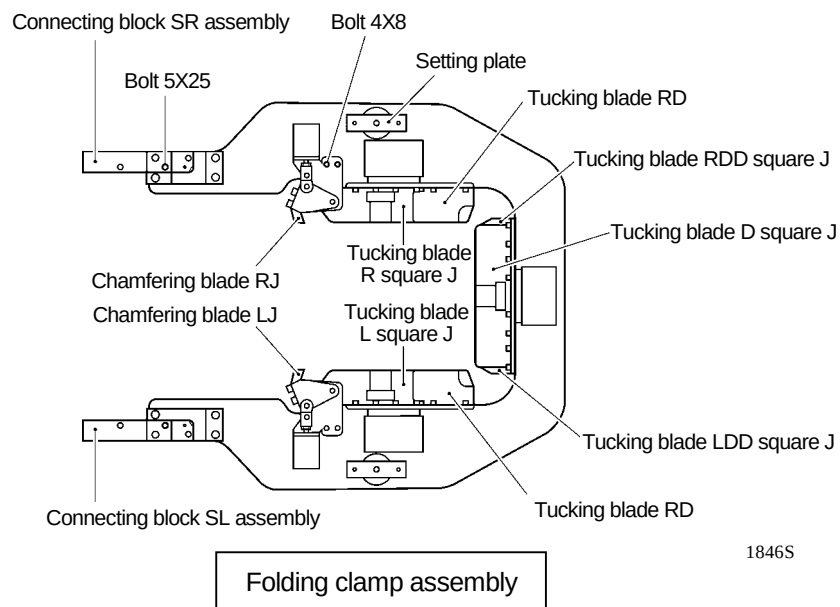
Because this is a basic property in a sewing machine, there is no fundamental measure for it. When adjusting, rotate the needle approximately 5-10 degree clockwise, looking from the bottom. Be sure not to rotate it more, which may result in the needle's striking the rotating hook.

8. The corners are round.

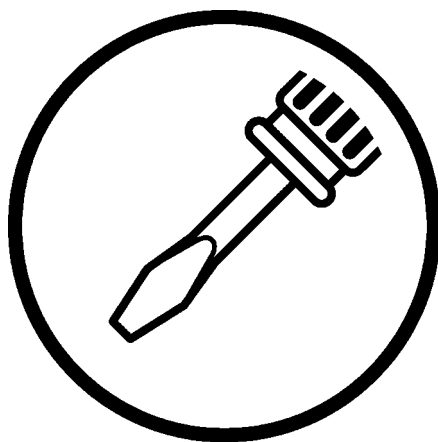
<Cause>

Tucking blade RD and LD are positioned backward from their correct position.

Shift the tucking blades forward, then adjust them so that their edges are aligned with the center blade corners when the cylinders driving the tucking blades work. (The alignment does not have to be perfect.) At this time, check that these tucking blades come into the clearance between tucking blades D and DD.



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